



United States Environmental Protection Agency
Washington, DC 20460

Completion Form For Injection Wells

Administrative Information

1. Permittee Florence Copper Inc.	
Address (Permanent Mailing Address) (Street, City, and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	
2. Operator Florence Copper Inc.	
Address (Street, City, State and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	
3. Facility Name Florence Copper Inc.	Telephone Number (520) 374-3984
Address (Street, City, State and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	

4. Surface Location Description of Injection Well(s)	
State Arizona	County Pinal

Surface Location Description

NE 1/4 of SE 1/4 of NW 1/4 of SW 1/4 of Section 28 Township 4S Range 9E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 960 ft. from (N/S) N Line of quarter section
and 1265 ft. from (E/W) E Line of quarter section.

Well Activity <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Class III <input type="checkbox"/> Other	Well Status <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Modification/Conversion <input type="checkbox"/> Proposed	Type of Permit <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area : Number of Wells 33
Lease Number NA	Well Number M57-O	

Submit with this Completion Form the attachments listed in Attachments for Completion Form.

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print) Ian Ream, Senior Hydrogeologist	Signature 	Date Signed 9-12-2018
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PAPERWORK REDUCTION ACT

The public reporting and record keeping burden for this collection of information is estimated to average 49 hours per response for a Class I hazardous facility, and 47 hours per response for a Class I non-hazardous facility. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

Attachments to be submitted with the Completion report:

I. Geologic Information

1. Lithology and Stratigraphy

A. Provide a geologic description of the rock units penetrated by name, age, depth, thickness, and lithology of each rock unit penetrated.

B. Provide a description of the injection unit.

- (1) Name
- (2) Depth (drilled)
- (3) Thickness
- (4) Formation fluid pressure
- (5) Age of unit
- (6) Porosity (avg.)
- (7) Permeability
- (8) Bottom hole temperature
- (9) Lithology
- (10) Bottom hold pressure
- (11) Fracture pressure

C. Provide chemical characteristics of formation fluid (attach chemical analysis).

D. Provide a description of freshwater aquifers.

- (1) Depth to base of fresh water (less than 10,000 mg/l TDS).
- (2) Provide a geologic description of aquifer units with name, age, depth, thickness, lithology, and average total dissolved solids.

II. Well Design and Construction

1. Provide data on surface, intermediate, and long string casing and tubing. Data must include material, size, weight, grade, and depth set.
2. Provide data on the well cement, such as type/class, additives, amount, and method of emplacement.
3. Provide packer data on the packer (if used) such as type, name and model, setting depth, and type of annular fluid used.

4. Provide data on centralizers to include number, type and depth.

5. Provide data on bottom hole completions.

6. Provide data on well stimulation used.

III. Description of Surface Equipment

1. Provide data and a sketch of holding tanks, flow lines, filters, and injection pump.

IV. Monitoring Systems

1. Provide data on recording and nonrecording injection pressure gauges, casing-tubing annulus pressure gauges, injection rate meters, temperature meters, and other meters or gauges.

2. Provide data on constructed monitor wells such as location, depth, casing diameter, method of cementing, etc.

V. Logging and Testing Results

Provide a descriptive report interpreting the results of geophysical logs and other tests. Include a description and data on deviation checks run during drilling.

VI. Provide an as-built diagrammatic sketch of the injection well(s) showing casing, cement, tubing, packer, etc., with proper setting depths. The sketch should include well head and gauges.

VII. Provide data demonstrating mechanical integrity pursuant to 40 CFR 146.08.

VIII. Report on the compatibility of injected wastes with fluids and minerals in both the injection zone and the confining zone.

IX. Report the status of corrective action on defective wells in the area of review.

X. Include the anticipated maximum pressure and flow rate at which injection will operate.

TECHNICAL MEMORANDUM

17 September 2018
File No. 129687-010

TO: Florence Copper Inc.
Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Lauren Candreva, R.G.

Subject: Drilling, Installation, and Integrity Testing Summary
PTF Supplemental Monitoring Well M57-O
Florence Copper Inc., Florence, Arizona



This document summarizes the drilling, installation, and testing of Production Test Facility (PTF) supplemental monitoring well M57-O for Florence Copper Inc. (Florence Copper) in Florence, Arizona, including the equipment used to perform the work, completion, and the results of well testing activities. Separate well completion reports have been created for each PTF well.

The Arizona Department of Water Resources Registry ID for well M57-O is 55-226790; the Well Registry Report is included in Appendix A. Well M57-O is located in the southeast quarter of the northwest quarter of the southwest quarter of Section 28 of Township 4 north, Range 9 East of the Gila and Salt River Baseline and Meridian (D(4-9)28CBD). Well M57-O is located within the Underground Injection Control (UIC) Permitted Area of Review (AOR) for UIC Permit R9UIC-AZ3-FY11-1 and was completed as a Class III supplemental monitoring well for the PTF (Figure 1).

Florence Copper contracted National Exploration, Wells, and Pumps (National EWP) to drill, install, and test well M57-O in accordance with *Bid Specification: Installation, of Class III Monitoring Wells, Production Test Facility, Florence, Arizona* (Haley & Aldrich, Inc. [Haley & Aldrich], 2015). A Schramm T685WS drilling rig was used for all drilling and construction activities. Haley & Aldrich provided intermittent oversight of drilling activities and provided complete oversight during key activities such as geophysical logging, well installation, and testing. All reported depths are in feet below ground surface unless otherwise noted.

I. Geologic Information

1. Lithology and Stratigraphy

A. Geology of Penetrated Units

The geology penetrated during the drilling of the Class III well M57-O is summarized below; a lithologic log is included in Appendix B.

Lithologic Unit Name	Depth to Bottom of Unit (feet)	Thickness of Unit (feet)	Lithology and Age of Unit
Upper Basin Fill Unit (UBFU)	283	283	Alluvium; Quaternary to Tertiary
Middle Fine-Grained Unit (MFGU)	302	19	Alluvium; Tertiary
Lower Basin Fill Unit (LBFU)	545	243	Alluvium; Tertiary to Cretaceous
Bedrock Oxide Unit (Oxide)	Not encountered	>665	Igneous porphyry; Precambrian

B. Description of Injection Unit

Name	Bedrock Oxide Unit
Depth Drilled	1,210 feet
Thickness	>665 feet
Formation Fluid Pressure	Atmospheric plus head of freshwater; no additional formation pressure
Age of Unit	Precambrian with intrusions of Precambrian to Tertiary rocks
Porosity ¹	Approximately 6 to 8.5%
Permeability	Hydraulic conductivity = 0.56 feet per day
Bottom Hole Temperature	30.7 degrees Celsius
Lithology	Igneous porphyry: quartz monzonite, granodiorite with diabase and andesite dykes (detailed log included in Appendix B)
Bottom Hole Pressure	Approximately 430 pounds per square inch (PSI) (pressure exerted by the column of freshwater with no additional contribution from formation pressure)
Fracture Pressure	0.65 PSI per foot
¹ Porosity values for the bedrock oxide unit are approximate values from calculated neutron porosity values from injection well borehole surveys.	

C. Chemical Characteristics of Formation Fluid

The chemical characteristics of the formation fluid in the injection zone are summarized below and are the sampling results from the center PTF wellfield well, R-09. The table below summarizes the primary chemical characteristics detected in a formation fluid sample collected on 23 April 2018; the complete analytical report is included in Appendix C.

Analyte	Result (mg/L)
Metals	
Aluminum	<0.08
Antimony	<0.005
Arsenic	0.0016
Barium	0.071
Beryllium	<0.0005
Cadmium	<0.00025
Calcium	140
Chromium	0.0051
Cobalt	<0.00025
Copper	0.011
Iron	<0.30
Lead	<0.0005
Magnesium	27
Manganese	0.002
Mercury	<0.001
Nickel	0.0033
Potassium	6.8
Selenium	<0.0025
Sodium	170
Thallium	<0.0005
Zinc	<0.04
Anions	
Bicarbonate	150
Chloride	310
Fluoride	<0.5
Nitrate	8.8
Sulfate	190
Field Parameters	
Total Dissolved Solids	1,000
pH	7.8
Radiochemicals	
Uranium	0.016
Notes: mg/L = milligrams per liter	

The water quality of each PTF monitoring well, including well M57-O, is summarized in *Procedures for Determining Alert Levels and Aquifer Quality Limits for Groundwater Compliance Monitoring* (Brown and Caldwell, 2018).

D. Description of Freshwater Aquifers

- 1) The depth to the base of the freshwater aquifer is defined by the interface where deeper formation fluid exhibits a total dissolved solids (TDS) value of 10,000 milligrams per liter (mg/L). The depth of the 10,000 mg/L interface is deeper than all of the wells drilled at the site and consequently has not been defined.

2) A geologic description of the aquifer units is included below:

Aquifer Unit Name	Age	Depth (feet)	Thickness (feet)	Lithology	Average Total Dissolved Solids ¹ (mg/L)
UBFU	Quaternary/Tertiary	0 to 283	283	Alluvium	914
LBFU	Tertiary	302 to 545	243	Alluvium	754

¹ Average TDS values calculated from UBFU and LBFU monitoring well ambient monitoring results near the PTF.

II. Well Design and Construction

1. Well M57-O Casing Installed

Casing	Material	Diameter (inches)	Weight (pounds per foot)	Depth (feet)	Borehole Diameter (inches)	Drilling Method
Surface	Mild steel	14 O.D. 13½ I.D.	47.36	0 to 40	17½	Conventional mud rotary
Well casing	Mild steel	5.66 O.D. 5.14 I.D.	5.40	-2.1 to 523	10⅝	Conventional mud rotary
Screen	PVC Sch. 80 with 0.020-inch wide slots	5.56 O.D. 4.81 I.D.	4.08	523 to 1,201	10⅝	Conventional mud rotary

Notes:
I.D. = inside diameter
O.D. = outside diameter
PVC = polyvinyl chloride
Sch. = Schedule

2. Well Cement

Cement Interval	Cement Type	Additives	Amount Installed (cubic yards)	Method of Emplacement
Surface casing	Type V Neat 21 sack slurry	None	1	Submerged tremie
Well casing	Type V Neat 21 sack slurry	None	10.5	Submerged tremie

Field forms documenting pipe tallies, annular materials, and cement tickets are included in Appendix D.

3. Annular Packers

No annular packers were used during construction of well M57-O.

4. Centralizers

Casing	Centralizer Type	Number and Spacing
Well – FRP and PVC	Stainless steel – heavy duty	28 installed – every 40 feet
Notes: <i>FRP = fiberglass reinforced plastic</i> <i>PVC = polyvinyl chloride</i>		

5. Bottom Hole Completion

There is no bottom hole completion, as this is not an oil/gas well. The well was completed at the bottom with a stainless-steel endcap of the same diameter as the well screen.

6. Well Stimulation

No well stimulation was used during the drilling and construction of well M57-O.

III. Description of Surface Equipment

1. Surface Equipment

Well M57-O is a supplemental monitoring well and has been equipped with a pressure transducer for monitoring water levels and a low-flow pump for collecting water quality samples. There is no surface equipment beyond the well casing stick-up and locking well vault. An as-built diagram of the well is included as Figure 2.

IV. Monitoring Systems

1. Well Monitoring Equipment

Well M57-O is a monitoring well and does not have any monitoring systems for injection. A pressure transducer with a data logger is installed in the well to collect water levels for compliance reporting.

2. Monitoring Wells

A total of 16 monitoring wells (including well M57-O) are associated with the PTF: 7 point of compliance (POC) wells, 7 United States Environmental Protection Agency (USEPA) supplemental monitoring wells, and 2 operational monitoring wells. The POC wells are located outside the AOR and are not constructed as Class III wells. The supplemental monitoring and operational monitoring wells are located within the AOR and are constructed as Class III wells as required by the UIC Permit.

The wells are summarized in the tables below by type.

POC Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M14-GL	846750.23 746461.52	859	5 9/16 OD	Submerged tremie	778 to 838	LBFU
M15-GU	846697.17 746464.82	615	5 9/16 OD	Submerged tremie	554 to 594	LBFU
M22-O	846751.26 746514.47	1,140	5 9/16 OD to 528 feet; 4½ OD to 1,140 feet	Submerged tremie	932 to 1,130	Oxide
M23-UBF	846688.13 746512.48	250	6½ OD	Submerged tremie	210 to 250	UBFU
M52-UBF	851092.00 774178.00	274	5 9/16	Submerged tremie	198 to 273	UBFU
M54-LBF	847331.96 746682.61	630	5 9/16	Submerged tremie	310 to 629	LBFU
M54-O	847342.99 746702.36	1,199	5 9/16	Submerged tremie	668 to 1,198	Oxide
OD = outside diameter						

Supplemental Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M55-UBF	847541.46 746280.63	261	5	Submerged tremie	240 to 260	UBFU
M56-LBF	847518.70 746303.41	340	5	Submerged tremie	320 to 340	LBFU
M57-O	847378.37 746248.93	1,200	5	Submerged tremie	523 to 1,199	Oxide
M58-O	847672.23 746595.97	1,200	5	Submerged tremie	594 to 1,199	Oxide
M59-O	847934.95 746218.89	1,201	5	Submerged tremie	534 to 1,199	Oxide
M60-O	847599.37 745903.70	1,201	5	Submerged tremie	444 to 1,200	Oxide
M61-LBF	848184.46 746148.88	629	5	Submerged tremie	429 to 629	LBFU

Operational Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval	Screened Lithologic Unit
MW-01-LBF	847487.97 746360.54	444	5	Submerged tremie	330 to 440	LBFU
MW-01-O	847499.04 746369.31	1,200	5	Submerged tremie	500 to 1,200	Oxide

V. Logging and Testing Results

Borehole geophysical logging was conducted on well M57-O in two phases: 1) open-hole surveys in the 12.25-inch borehole prior to installation of the well casing and screen, and 2) cased-hole surveys in the completed well.

The open-hole geophysical surveys completed at well M57-O included:

- Spontaneous potential;
- Natural gamma;
- Electrical resistivity (short and long normal);
- Caliper with calculated volume;
- Temperature;
- Sonic; and
- Deviation.

The cased-hole geophysical surveys completed included:

- Cement bond log;
- Sonic (for cement evaluation);
- 4 pi density (for cement evaluation);
- Dual density (for cement evaluation);
- Natural gamma;
- Fluid conductivity; and
- Temperature.

Open-hole geophysical surveys were used to support identification of the lithologic contacts, to evaluate the condition of the borehole, and to evaluate the deviation of the borehole.

The primary logs used to evaluate lithologic contacts were natural gamma ray, short (16-inch) and long (64-inch) normal electrical resistance, and single-point resistance.

The lithologic contacts for the Middle Fine-Grained Unit (MFGU) were selected based on the short and long resistance and the single-point resistance. All the resistivity values decreased and remained consistently low through the MFGU. This contact is generally characterized by a relatively sharp decrease in resistance at the top of the unit and a gradual increase in resistance below the bottom of the unit.

The contact between the Lower Basin Fill Unit (LBFU) and the bedrock was identified primarily using the natural gamma and correlated with the resistance logs. There is a consistent increase in gamma values at the contact between the LBFU and the bedrock that was identified and documented at the site during exploration in the 1990s. For well M57-O, the gamma values are consistent at approximately 90 American Petroleum Institute (API) units throughout the Upper Basin Fill Unit (UBFU), increase slightly to approximately 100 API units in the MFGU through the LBFU, and increase between 535 and 555 feet (averaged to 545) to over 120 API units where the electrical resistance shifts. After the increase at approximately 545 feet, the natural gamma values begin to vary more than in the alluvial units. This change in the response of the natural gamma indicates the contact with the bedrock unit. Also, at this approximate depth, the resistance increases, likely because the bedrock contains less water, leading to increased resistivity.

Cased-hole geophysical surveys were conducted to evaluate the cement seal and the casing-cement bond, to document baseline fluid temperature and conductivity, and to evaluate the plumbness of the well. The cement bond is discussed in Section VII.

Copies of all the geophysical logs are included in Appendix E; a figure summarizing the open-hole logs used to evaluate the geology is included as Figure 3.

VI. Well As-Built Diagram

An as-built diagram for well M57-O is included as Figure 2.

VII. Demonstration of Mechanical Integrity

A demonstration of Part I mechanical integrity of the well was completed using a standard annular pressure test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. Mechanical integrity will be demonstrated every 2 years during operations. The SAPT for well M57-O is summarized below.

The SAPT was conducted by installing an inflatable packer in the well secured with a threaded well seal at the surface. The packer was installed near the bottom of the FRP-cased portion of the well and the wellhead was equipped with a water-tight threaded wellhead; the packer was inflated to form a seal against the casing. The bottom 5 feet of the packer drop pipe was perforated to allow for communication between the tubing and the annulus of the packer assembly. The drop pipe extended through the wellhead and a high pressure/low volume pump was attached to the drop pipe to pressurize the test interval. A valve on the drop pipe at the surface was used to isolate the test interval once the planned test pressure was achieved.

An In-Situ LevelTROLL® pressure transducer with a data logger was installed at the well head and connected to the packer assembly annulus interval via a National Pipe Thread adapter. The LevelTROLL was used to monitor and record pressure inside the well during the SAPT. To conduct the SAPT, water was pumped from a nearby well immediately prior to testing. Before the water was pumped into the test well, the water temperature was measured to ensure that it was similar to the ambient groundwater temperature of the test well to reduce the potential for differential temperature effects on the well casing. The SAPT for the Class III well was conducted by applying hydraulic pressure to the well casing and shutting in pressure between the packer and wellhead assembly, monitoring the shut-in pressure for a 30-minute period, then measuring the volume of water returned from the well casing after the pressure was released.

On 14 June 2017, the packer was installed to approximately 490 feet and the SAPT was conducted successfully two times. The USEPA SAPT form, a table of the data, and a chart of the data is provided in Appendix F.

Part II mechanical integrity is demonstrated by the cementing records included in this report (in accordance with Part II.E.3.ii.C of the UIC Permit) and will be demonstrated during operations by annular conductivity monitoring on the observation and multi-level sampling wells (in accordance with Part II.E.3.a.ii.A of the UIC Permit).

Cemented Interval	Cement Type	Calculated Grout Volume (cubic yards)	Installed Grout Volume (cubic yards)
Surface casing	Type V 21 sack neat cement slurry	0.9	1
Well casing	Type V 21 sack neat cement slurry	9.7	10.5

On 15 March 2017, a cement bond log was run over the entire length of the completed well to verify the grout seal. A summary of the logs completed to demonstrate cement bond are included in Appendix G.

The cement bond of the steel casing at well M57-O was evaluated by the geophysical contractor by running a cement bond log and calculating a bond index. The bond index was calculated to be greater than 90 percent over the cement grouted interval from approximately 275 feet (static water level) to 490 feet. In addition to the cement bond, density data was collected to evaluate the unsaturated interval; the density data indicate that there are no significant cement deficiencies at well M57-O in the cement interval. The data is included on the summary log in Appendix G.

VIII. Compatibility of Injected Waste

The Florence Copper Project is a Class III mineral extraction project and does not include the injection of any waste products of any kind. The injected fluid (lixiviant) is a carefully constituted in-situ copper recovery solution that will be recovered and recycled following injection.

The compatibility of the lixiviant was evaluated as part of the geochemical modeling completed by Florence Copper and summarized in the *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona* (Daniel B. Stephens Inc., 2014) which was included in Attachment H of the UIC Permit Application.

IX. Status of Corrective Action on Defective Wells in the Area of Review

There are not currently any defective wells in the AOR.

X. Maximum Pressures and Flow Rates for M57-O

Maximum Operating Pressure	Maximum Flow
Atmospheric	Not applicable – monitoring well

This well is a monitoring well used to monitor water quality downgradient of the PTF. No fluids will be injected.

XI. Well Development

Well M57-O was developed by pumping; development was completed by National EWP using a workover rig. On 30 March 2017, a submersible pump was temporarily installed to approximately 1,165 feet to pump develop the well. Pump development was conducted at approximately 20 gallons per minute over a period of 3 days (30 March to 4 April), and periodically turned off to surge the well. Water levels rebounded to approximately 224 feet prior to the next pumping period. At the end of pump development, turbidity values were less than 2 Nephelometric Turbidity Units. Well development forms are included in Appendix H.

XII. Well Completion

A well video survey was conducted on 5 June 2017; the video log report is included in Appendix I. The video log depths are presented in feet below the top of the casing and thus vary slightly from what is recorded; however, these values are the same with the correction for stick up.

The surveyed location for well M57-O is as follows:

Northing (feet)	Easting (feet)	Measuring Point Elevation (feet amsl)
746272.70	847765.50	1481.08
Notes: <i>Northing and easting locations provided in State Plane North American Datum 1983; vertical location provided in North American Vertical Datum 1988. amsl = above mean sea level</i>		

XIII. Downhole Equipment

Permanent equipment installed in well M57-O includes the following:

- QED® low-flow sampling pump hung on drop tubing (pump at 950 feet); and
- Pressure transducer.

The type and depth of equipment installed in each well is not constrained by the UIC Permit or the Aquifer Protection Permit (APP). This information is provided in accordance with Section 2.7.4.3 of the APP. Operational considerations may require that the type and depth of equipment be changed in response to conditions observed during operations.

XIV. References

Brown and Caldwell, Inc., 2018. *Procedures for Determining Alert Levels and Aquifer Quality Limits for Groundwater Compliance Monitoring, Florence Copper Project, Florence, Arizona*. June.

Daniel B. Stephens, Inc., 2014. *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona*. Prepared for Florence Copper. May.

Haley & Aldrich, Inc., 2017. *Bid Specification: Installation, of Class III Monitoring Wells, Production Test Facility, Florence, Arizona*. Revised September 2017.

Enclosures:

Figure 1 – Well Locations

Figure 2 – M57-O Supplemental Monitoring Well As-Built Diagram

Figure 3 – Geophysical Data and Lithologic Log

Appendix A – Arizona Department of Water Resources Well Registry Report

Appendix B – Lithologic Log

Appendix C – Chemical Characteristics of Formation Water

Appendix D – Well Completion Documentation

Appendix E – Geophysical Logs

Appendix F – SAPT Documentation

Appendix G – Cement Bond Log Summary

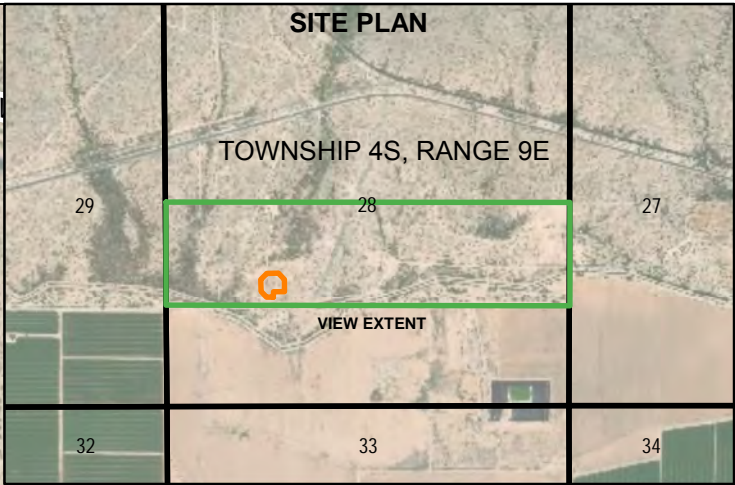
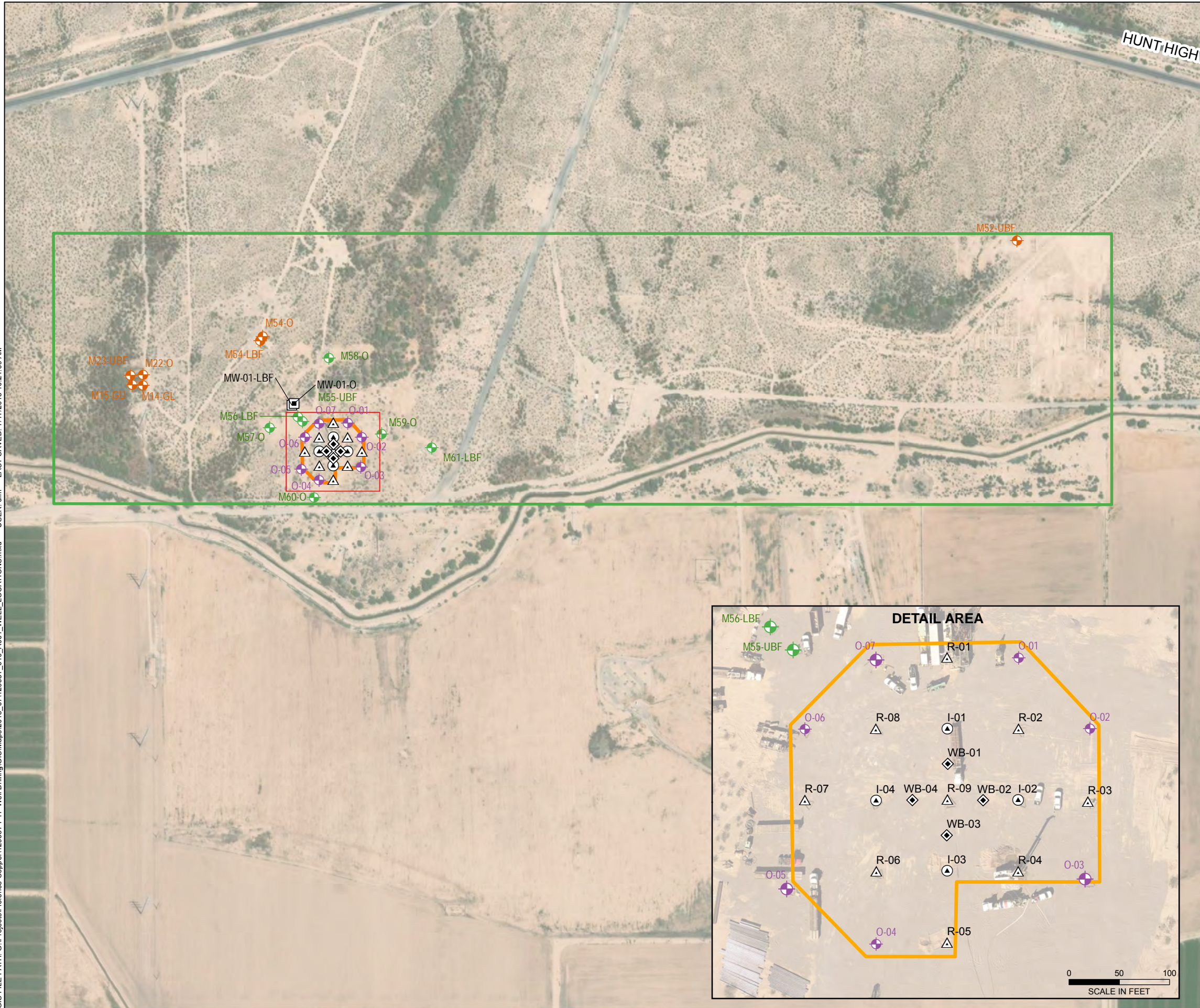
Appendix H – Well Development Field Forms

Appendix I – Well Video Log Report

\\\\haleyaldrich.com\\share\\phx_common\\Projects\\Florence Copper\\129687 PTF Well Drilling\\Deliverables\\Well Summary Reports\\M57-O\\2018-0917_M-57-O Well
Install Comp Letter Report_EPA vers_F.docx

FIGURES

GIS FILE PATH: G:\Projects\Florence Copper\129687 PTF Well Drilling\GIS\Maps\2018_07129687_010_A001_WELL_LOCATIONS.mxd — USER: dfm — LAST SAVED: 7/17/2018 10:24:09 AM



LEGEND

- OBSERVATION WELL
- SUPPLEMENTAL MONITORING WELL
- POINT-OF-COMPLIANCE WELL

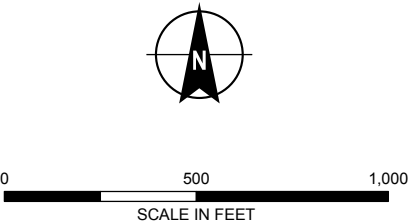
PTF WELL

- INJECTION
- RECOVERY
- WESTBAY WELL
- OPERATIONAL MONITORING

- PTF WELL FIELD
- STATE LAND LEASE

NOTES

- ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- AERIAL IMAGERY SOURCE: ESRI



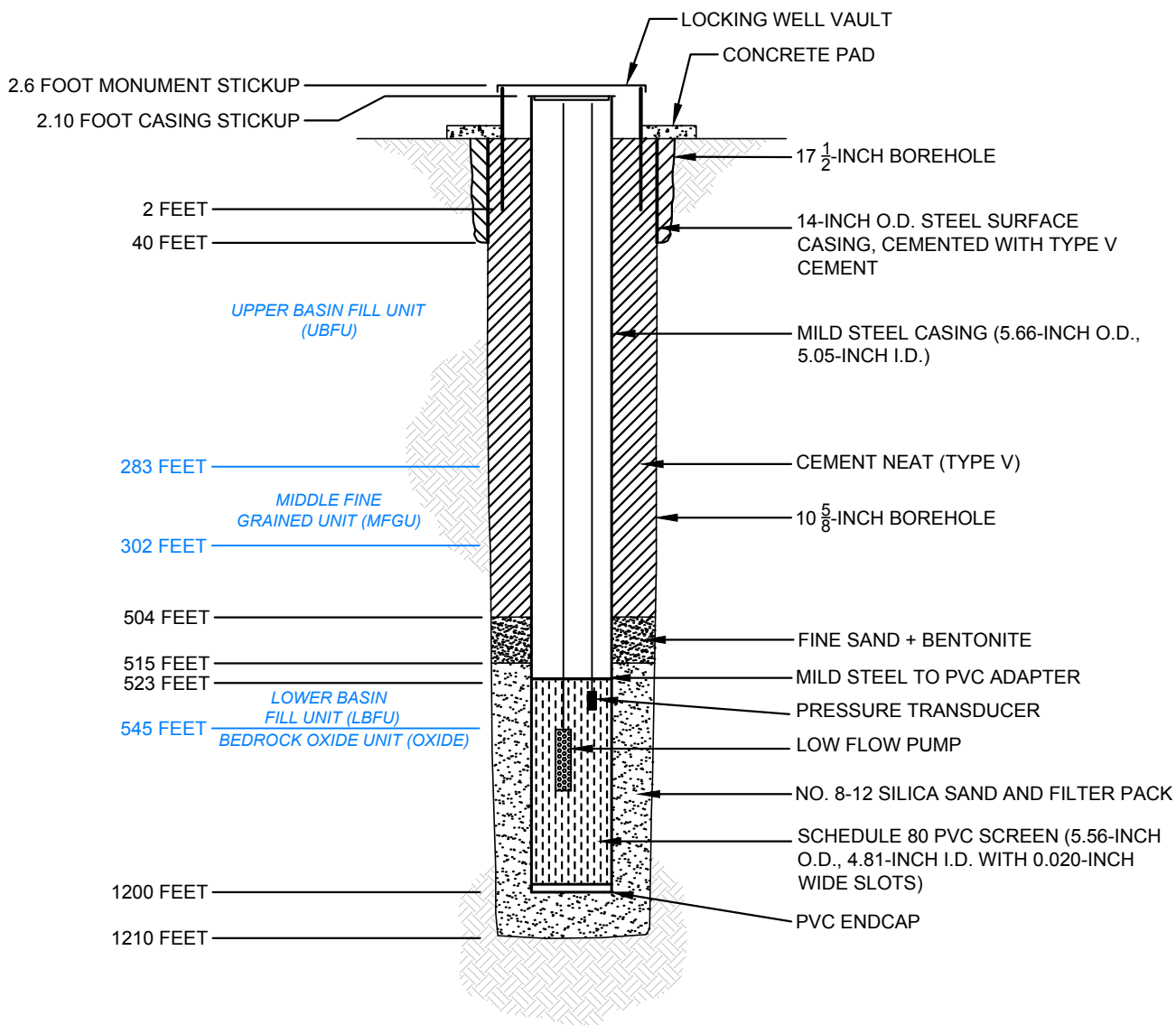
**HALEY
ALDRICH**

FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

WELL LOCATIONS

**FLORENCE
COPPER INC.** AUGUST 2018

FIGURE 1



NOTES

1. WELL REGISTRATION NO.: 55-226790
2. CADASTRAL LOCATION: D (4-9) 28 CBD
3. TOP OF CASING ELEVATION: 1478.71' AMSL
4. CONCRETE PAD ELEVATION: 1476.77' AMSL
5. I.D. = INSIDE DIAMETER
6. O.D. = OUTSIDE DIAMETER
7. PVC = POLYVINYL CHLORIDE



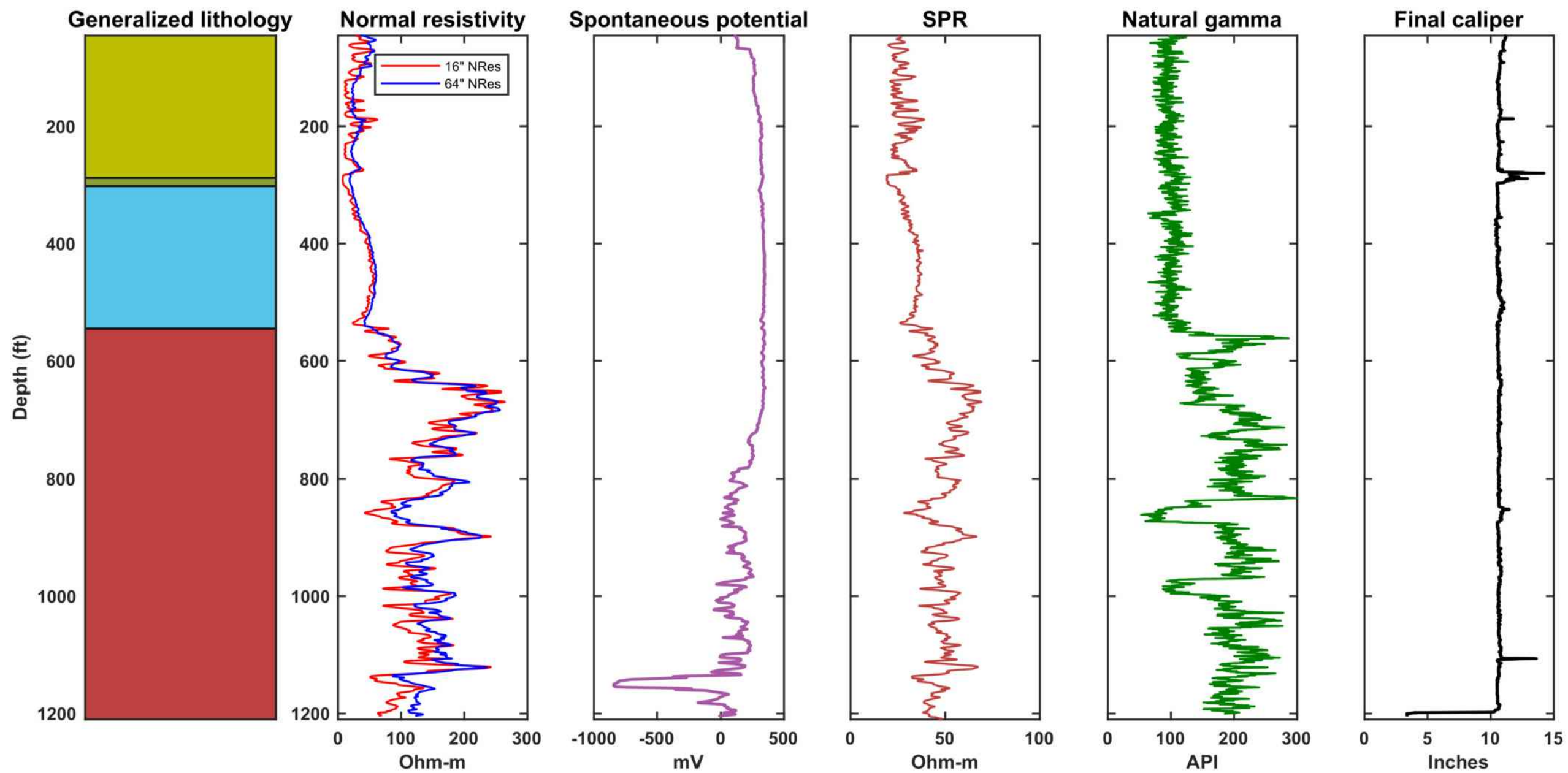
PRODUCTION TEST FACILITY
 FLORENCE COPPER, INC.
 FLORENCE, ARIZONA

M57-O SUPPLEMENTAL MONITORING WELL AS-BUILT DIAGRAM



SCALE: NOT TO SCALE
 SEPTEMBER 2018

FIGURE 2



HALEY
ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

M57-O SUPPLEMENTAL MONITORING
WELL GEOPHYSICAL DATA AND
LITHOLOGIC LOG

FLORENCE
COPPER

SCALE: AS SHOWN
SEPTEMBER 2018

FIGURE 3

APPENDIX A

Arizona Department of Water Resources Well Registry Report



Arizona Department of Water Resources
Water Management Division
P.O. Box 36020 Phoenix, Arizona 85067-6020
(602) 771-8627 • (602) 771-8690 fax
www.azwater.gov

Well Driller Report and Well Log

APR 10 2017

ADWR

FILE NUMBER

WELL REGISTRATION NUMBER

55 - 226790

PERMIT NUMBER (IF ISSUED)

THIS REPORT MUST BE FILED WITHIN 30 DAYS OF COMPLETING THE WELL.

PLEASE PRINT CLEARLY USING BLACK OR BLUE INK.

SECTION 1. DRILLING AUTHORIZATION

Drilling Firm

Mail To:

NAME
National EWP
ADDRESS
1200 west San Pedro Street
CITY / STATE / ZIP
Gilbert, AZ, 85233

DWR LICENSE NUMBER 823

TELEPHONE NUMBER
480-558-3500

FAX

IMAGED

SECTION 2. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL
Florence Copper, INC

MAILING ADDRESS
1575 W. Hunt HWY

CITY / STATE / ZIP CODE
Florence, AZ, 85132

CONTACT PERSON NAME AND TITLE
Ian Ream, Senior Hydrologist

TELEPHONE NUMBER
520 374 3984

FAX

WELL NAME (e.g., MW-1, PZ-3, Lot 25 Well, Smith Well, etc.)

M57-0

Location of Well

WELL LOCATION ADDRESS (IF ANY)

Same as well owner

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
4.0S	9.0 E	28	SW ¼	NW ¼	SE ¼

LATITUDE			LONGITUDE		
33 ° Degrees	3 Minutes	1.887" N Seconds	111 ° Degrees	26 Minutes	8.371" W Seconds

METHOD OF LATITUDE/LONGITUDE (CHECK ONE)
☒ *GPS: Hand-Held ☐ *GPS: Survey-Grade

LAND SURFACE ELEVATION AT WELL
1492 Feet Above Sea Level

METHOD OF ELEVATION (CHECK ONE)
☒ *GPS: Hand-Held ☐ *GPS: Survey-Grade

*GEOGRAPHIC COORDINATE DATUM (CHECK ONE)
☒ NAD-83 ☐ Other (please specify):

COUNTY

Pinal

ASSESSOR'S PARCEL ID NUMBER

BOOK 0

MAP 0

PARCEL 0

SECTION 3. WELL CONSTRUCTION DETAILS

Drill Method

CHECK ALL THAT APPLY

- ☐ Air Rotary
☐ Bored or Augered
☐ Cable Tool
☐ Dual Rotary
☒ Mud Rotary
☐ Reverse Circulation
☐ Driven
☐ Jetted
☐ Air Percussion / Odex Tubing
☐ Other (please specify):

Method of Well Development

CHECK ALL THAT APPLY

- ☐ Airlift
☐ Bail
☐ Surge Block
☒ Surge Pump
☐ Other (please specify):

Condition of Well

CHECK ONE

- ☐ Capped
☒ Pump Installed

Method of Sealing at Reduction Points

CHECK ONE

- ☒ None
☐ Packed
☐ Swedged
☐ Welded
☐ Other (please specify):

Construction Dates

DATE WELL CONSTRUCTION STARTED

3-9-17

DATE WELL CONSTRUCTION COMPLETED

3-10-17

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

SIGNATURE OF QUALIFYING PARTY

DATE

4-5-17

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 226790

SECTION 4. WELL CONSTRUCTION DESIGN (AS BUILT) (attach additional page if needed)

Depth
DEPTH OF BORING
1210

Feet Below Land Surface

DEPTH OF COMPLETED WELL
1199

Feet Below Land Surface

Water Level Information

STATIC WATER LEVEL	Feet Below Land Surface
223	

DATE MEASURED
3-10-17

TIME MEASURED
12:00PM

IF FLOWING WELL, METHOD OF FLOW REGULATION
☐ Valve ☐ Other:

Installed Casing

[illegible]

Installed Annular Material

[illegible]

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 226790

[illegible]

55 - 226790

PARCEL 0

NAME OF WELL OWNER
Florence Copper

- ❖ Please draw the following: (1) the boundaries of property on which the well was located; (2) the well location; (3) the locations of all septic tank systems and sewer systems on the property or within 100 feet of the well location, even if on neighboring properties; and (4) any permanent structures on the property that may aid in locating the well.
- ❖ Please indicate the distance between the well location and any septic tank system or sewer system.



1" = _____ ft

Run Date: 01/13/2017

AZ DEPARTMENT OF WATER RESOURCES

WELL REGISTRY REPORT - WELLS55

Location	D	4.0	9.0	28	C	B	D	Well Reg.No	55 - 226790	AMA	PINAL	AMA
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Registered Name	FLORENCE COPPER, INC. 1575 W. HUNT HWY	File Type	NEW WELLS (INTENTS OR APPLICATIONS)
	FLORENCE	Application/Issue Date	01/11/2017
	AZ 85132		

Owner	OWNER	Well Type	ENV - MONITOR
Driller No.	823	SubBasin	ELOY
Driller Name	NATIONAL EWP, INC.	Watershed	UPPER GILA RIVER
Driller Phone	480-558-3500	Registered Water Uses	MONITORING
County	PINAL	Registered Well Uses	MONITOR
		Discharge Method	NO DISCHARGE METHOD LISTED
Intended Capacity GPM	0.00	Power	NO POWER CODE LISTED

Well Depth	0.00	Case Diam	0.00	Tested Cap	0.00
Pump Cap.	0.00	Case Depth	0.00	CRT	
Draw Down	0.00	Water Level	0.00	Log	
		Acres Irrig	0.00	Finish	NO CASING CODE LISTED

Contamination Site: NO - NOT IN ANY REMEDIAL ACTION SITE

Tribe: Not in a tribal zone

Comments Well M57-O
Landownership: AZ State Land Dept. (Mineral Lease #11-026500)
TV

Current Action

1/13/2017	555	DRILLER & OWNER PACKETS MAILED
Action Comment: TNV		

Action History

1/13/2017	550	DRILLING AUTHORITY ISSUED
Action Comment: TNV		
1/11/2017	155	NOI RECEIVED FOR A NEW NON-PRODUCTION WELL
Action Comment: TNV		

ARIZONA DEPARTMENT OF WATER RESOURCES
1110 W. Washington St. Suite 310
Phoenix, Arizona 85007

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILLING OPERATIONS

WELL REGISTRATION NO: **55-226790**

AUTHORIZED DRILLER: **NATIONAL EWP, INC.**

LICENSE NO: **823**

NOTICE OF INTENTION TO DRILL ENV - MONITOR WELL(S) HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: **FLORENCE COPPER, INC. 1575 W. HUNT HWY FLORENCE, AZ, 85132**

THE WELL(S) IS/ARE TO BE LOCATED IN THE:

SE 1/4 of the NW 1/4 of the SW 1/4 Section 28 Township 4.0 SOUTH Range 9.0 EAST

NO. OF WELLS IN THIS PROJECT: **1**

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE DAY OF **January 11, 2018**

Sella Munillo

GROUNDWATER PERMITTING AND WELLS

THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING.



ARIZONA DEPARTMENT of WATER RESOURCES
1110 W. Washington St. Suite 310
Phoenix, AZ 85007
602-771-8500
azwater.gov

January 13, 2017

FLORENCE COPPER, INC.
1575 W. HUNT HWY
FLORENCE, AZ 85132



DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

Registration No. 55- 226790
File Number: D(4-9) 28 CBD

Dear Well Applicant:

Enclosed is a copy of the Notice of Intention to Drill (NOI) a well which you or your driller recently filed with the Department of Water Resources. This letter is to inform you that the Department has approved the NOI and has mailed, or made available for download, a drilling authorization card to your designated well drilling contractor. The driller may not begin drilling until he/she has received the authorization, and must keep it in their possession at the well site during drilling. Although the issuance of this drill card authorizes you to drill the proposed well under state law, the drilling of the well may be subject to restrictions or regulations imposed by other entities.

Well drilling activities must be completed within one year after the date the NOI was filed with the Department. If drilling is not completed within one year, a new NOI must be filed and authorization from this Department received before proceeding with drilling. If the well cannot be successfully completed as initially intended (dry hole, cave in, lost tools, etc.), the well must be properly abandoned and a Well Abandonment Completion Report must be filed by your driller [as required by A.A.C. R12-15-816(F)].

If you change drillers, you must notify the Department of the new driller's identity on a Request to Change Well Information (form 55-71A). Please ensure that the new driller is licensed by the Department to drill the type of well you require. A new driller may not begin drilling until he/she receives a new drilling authorization card from the Department.

If you find it necessary to change the location of the proposed well(s), you may not proceed with drilling until you file an amended NOI with the Department. An amended drilling authorization card will then be issued to the well drilling contractor, which must be in their possession before drilling begins.

Arizona statute [A.R.S. § 45-600] requires registered well owners to file a Pump Installation Completion Report (form 55-56) with the Department within 30 days after the installation of pumping equipment, if authorized. A blank report is enclosed for your convenience. State statute also requires the driller to file a complete and accurate Well Drillers Report and Well Log (form 55-55) within 30 days after completion of drilling. A blank report form was provided to your driller with the drilling authorization card. You should insist and ensure that all of the required reports are accurately completed and timely filed with the Department.

Please be advised that Arizona statute [A.R.S. § 45-593(C)] requires a registered well owner to notify the Department of a change in ownership of the well and/or information pertaining to the physical characteristics of the well in order to keep this well registration file current and accurate. Any change in well information or a request to change well driller must be filed on a Request to Change Well Information form (form 55-71A) that may be downloaded from the ADWR Internet website at www.azwater.gov.

Sincerely,

Groundwater Permitting and Wells Section

Arizona Department of Water Resources Groundwater Permitting and Wells Section P.O. Box 36020 Phoenix, Arizona 85067-6020 (602) 771-8500 • (602) 771-8690 www.azwater.gov	Notice of Intent to Drill, Deepen, or Modify a Monitor / Piezometer / Environmental Well	\$150 FEE
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- ❖ Review instructions prior to completing form in black or blue ink.
 - ❖ You must include with your Notice:
 - \$150 check or money order for the filing fee.
 - Well construction diagram, labeling all specifications listed in Section 6 and Section 7.
- Authority for fee: A.R.S. § 45-596 and A.A.C. R12-15-104.

AMA / INA <i>Pinel</i>	B <i>PNW</i>	SB <i>11</i>	FILE NUMBER <i>D44-9728 CBD</i>
RECEIVED <i>1/11/2017</i>	DATE <i>08 UGR</i>	WS <i>000</i>	WELL REGISTRATION NUMBER <i>55 - 226790</i>
ISSUED <i>1/13/2017</i>	DATE	REMEDIAL ACTION SITE	

SECTION 1. REGISTRY INFORMATION

To determine the location of well, please refer to the Well Registry Map (<https://gisweb.azwater.gov/WellRegistry/Default.aspx>) and/or Google Earth (<http://www.earthpoint.us/Townships.aspx>)

Well Type	Proposed Action	Location of Well												
CHECK ONE	CHECK ONE	WELL LOCATION ADDRESS (IF ANY)												
<input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Piezometer <input type="checkbox"/> Vadose Zone <input type="checkbox"/> Air Sparging <input type="checkbox"/> Soil Vapor Extraction <input type="checkbox"/> Other (please specify):	<input checked="" type="checkbox"/> Drill New Well <input type="checkbox"/> Deepen <input type="checkbox"/> Modify	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TOWNSHIP(N/S)</th> <th>RANGE (E/W)</th> <th>SECTION</th> <th>160 ACRE</th> <th>40 ACRE</th> <th>10 ACRE</th> </tr> <tr> <td>4.0 S</td> <td>9.0 E</td> <td>28</td> <td>SW ¼</td> <td>NW ¼</td> <td>SE ¼</td> </tr> </table>	TOWNSHIP(N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE	4.0 S	9.0 E	28	SW ¼	NW ¼	SE ¼
TOWNSHIP(N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE									
4.0 S	9.0 E	28	SW ¼	NW ¼	SE ¼									
	WELL REGISTRATION NUMBER (if Deepening or Modifying) <i>55 -</i>	COUNTY ASSESSOR'S PARCEL ID NUMBER												
		BOOK MAP PARCEL <i>1001</i>												
		COUNTY WHERE WELL IS LOCATED <i>PINAL</i>												

SECTION 2. OWNER INFORMATION

Land Owner	Well Owner (check this box if Land Owner and Well Owner are same <input type="checkbox"/>)
FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL <i>AZ State Land Dept (Mineral Lease # 11-026500)</i>	FULL NAME OF COMPANY, GOVERNMENT AGENCY, OR INDIVIDUAL <i>Florence Copper, Inc.</i>
MAILING ADDRESS <i>1616 W Adams St</i>	MAILING ADDRESS <i>1575 W Hunt Hwy</i>
CITY / STATE / ZIP CODE <i>Phoenix, AZ 85007</i>	CITY / STATE / ZIP CODE <i>Florence, AZ 85132</i>
CONTACT PERSON NAME AND TITLE <i>Lisa Atkins, State Land Commissioner</i>	CONTACT PERSON NAME AND TITLE <i>Ian Ream, Senior Hydrogeologist</i>
TELEPHONE NUMBER <i>(602) 542-4631</i>	TELEPHONE NUMBER <i>(520) 374-3984</i>
FAX	FAX <i>(520) 374-3999</i>

SECTION 3. DRILLING AUTHORIZATION

Drilling Firm	Consultant (if applicable)
NAME <i>National EWP</i>	CONSULTING FIRM <i>Haley & Aldrich, Inc.</i>
DWR LICENSE NUMBER <i>823</i>	CONTACT PERSON NAME <i>Mark Nicholls</i>
ROC LICENSE CATEGORY <i>A-4</i>	TELEPHONE NUMBER <i>602-760-2423</i>
TELEPHONE NUMBER <i>(480) 558-3540</i>	FAX <i>602-760-2448</i>
EMAIL ADDRESS <i>jstephens@nationalewp.com</i>	EMAIL ADDRESS <i>mnicholls@haleyaldrich.com</i>

SECTION 4.

Questions	Yes	No	Explanation:
1. Are all annular spaces between the casing(s) and the borehole for the placement of grout at least 2 inches?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2-inch annular spaces are special standards required for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
2. Is the screened or perforated interval of casing greater than 100 feet in length?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	100-foot maximum screen intervals are a special standard for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
3. Are you requesting a variance to use thermoplastic casing in lieu of steel casing in the surface seal?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The wells must be constructed in a vault. Pursuant to A.A.C. R12-15-801 (27) a "vault" is defined as a tamper-resistant watertight structure used to complete a well below the land surface.
4. Is there another well name or identification number associated with this well? (e.g., MW-1, PZ2, 06-04, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, please state <i>M57-O</i>
5. Have construction plans been coordinated with the Arizona Department of Environmental Quality?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, please state agency contact & phone number <i>David Haas, 602-771-4669</i>
6. For monitor wells, is dedicated pump equipment to be installed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, please state design pump capacity (Gallons per Minute) <i>Low-flow</i>
7. Is this well a new well located in an Active Management Area AND intended to pump water for the purpose of remediating groundwater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	You must also file a supplemental form A.R.S. § 45-454(c) & (f) unless the well is a replacement well and the total number of operable wells on the site is not increasing. (See instructions)
8. Will the well registration number be stamped on the vault cover or on the upper part of the casing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If no, where will the registration number be placed?

Notice of Intent to Drill, Deepen, or Modify a Monitor / Piezometer / Environmental Well

WELL REGISTRATION NUMBER
55 - 226790

SECTION 6. WELL CONSTRUCTION DETAILS

Drill Method	Method of Well Development	Grout Emplacement Method
CHECK ONE <input type="checkbox"/> Air Rotary <input type="checkbox"/> Bored or Augered <input type="checkbox"/> Cable Tool <input type="checkbox"/> Dual Rotary <input checked="" type="checkbox"/> Mud Rotary <input type="checkbox"/> Reverse Circulation <input type="checkbox"/> Driven <input type="checkbox"/> Jetted <input type="checkbox"/> Air Percussion / Odex Tubing <input type="checkbox"/> Other (please specify):	CHECK ONE <input checked="" type="checkbox"/> Airlift <input type="checkbox"/> Bail <input type="checkbox"/> Surge Block <input type="checkbox"/> Surge Pump <input type="checkbox"/> Other (please specify):	CHECK ONE <input checked="" type="checkbox"/> Tremie Pumped (Recommended) <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure Grout <input type="checkbox"/> Other (please specify):
	Method of Sealing at Reduction Points	Surface or Conductor Casing
DATE CONSTRUCTION TO BEGIN 01/16/2017	CHECK ONE <input checked="" type="checkbox"/> None <input type="checkbox"/> Welded <input type="checkbox"/> Swedged <input type="checkbox"/> Packed <input type="checkbox"/> Other (please specify):	CHECK ONE <input type="checkbox"/> Flush Mount in a vault <input checked="" type="checkbox"/> Extends at least 1' above grade

SECTION 7. PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

Borehole			Casing													
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (T)				PERFORATION TYPE (T)					SLOT SIZE IF ANY (inches)	
FROM (feet)	TO (feet)		FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS	KNIFE		SLOTTED
0	20	20	0	20	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
20	1210	10.5	0	525	5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
			525	1200	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		0.020

Annular Material

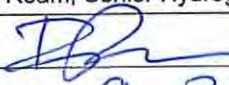
DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (T)								FILTER PACK	
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL
0	505	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
505	515	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
515	1210	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS										EXPECTED DEPTH TO WATER (Feet Below Ground Surface)	
										223	

SECTION 8. PERMISSION TO ACCESS

☐ By checking this box, I hereby provide ADWR permission to enter the property for the purpose of taking water level measurements at this well. (See instructions.)

SECTION 9. LAND OWNER AND WELL OWNER SIGNATURE

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and

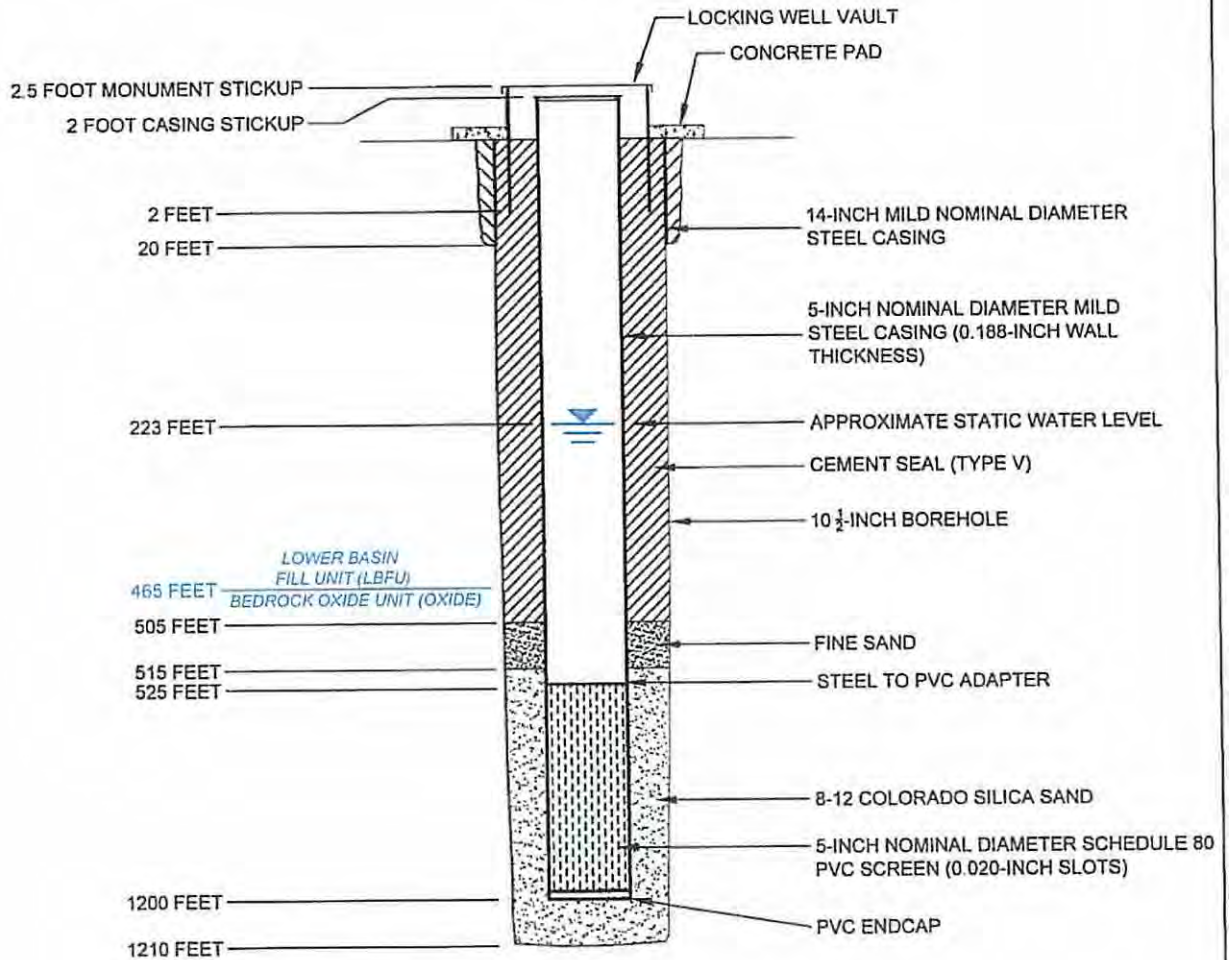
Land Owner	Well Owner (if different from Land Owner; See instructions)
PRINT NAME AND TITLE	PRINT NAME AND TITLE Ian Ream, Senior Hydrogeologist
SIGNATURE OF LAND OWNER	SIGNATURE OF WELL OWNER 
DATE	DATE Jan 9, 2017
<input type="checkbox"/> By checking this box, you agree to allow ADWR to contact you via electronic mail.	<input checked="" type="checkbox"/> By checking this box, you agree to allow ADWR to contact you via electronic mail.
EMAIL ADDRESS	EMAIL ADDRESS IanReam@florencecopper.com

SECTION 5. Well Construction Diagram

Provide a well construction diagram showing all existing well construction features listed in Section 6 and Section 7.

See attached well diagram.

55-226790



MOBILI, GITA
G:\PROJECTS\CURIS RESOURCES\50708-CURIS FEASIBILITY\DRAWINGS\M57-O_WELL.DWG
Printed: 8/28/2015 2:14 PM Layout: M57-O

HALEY
ALDRICH

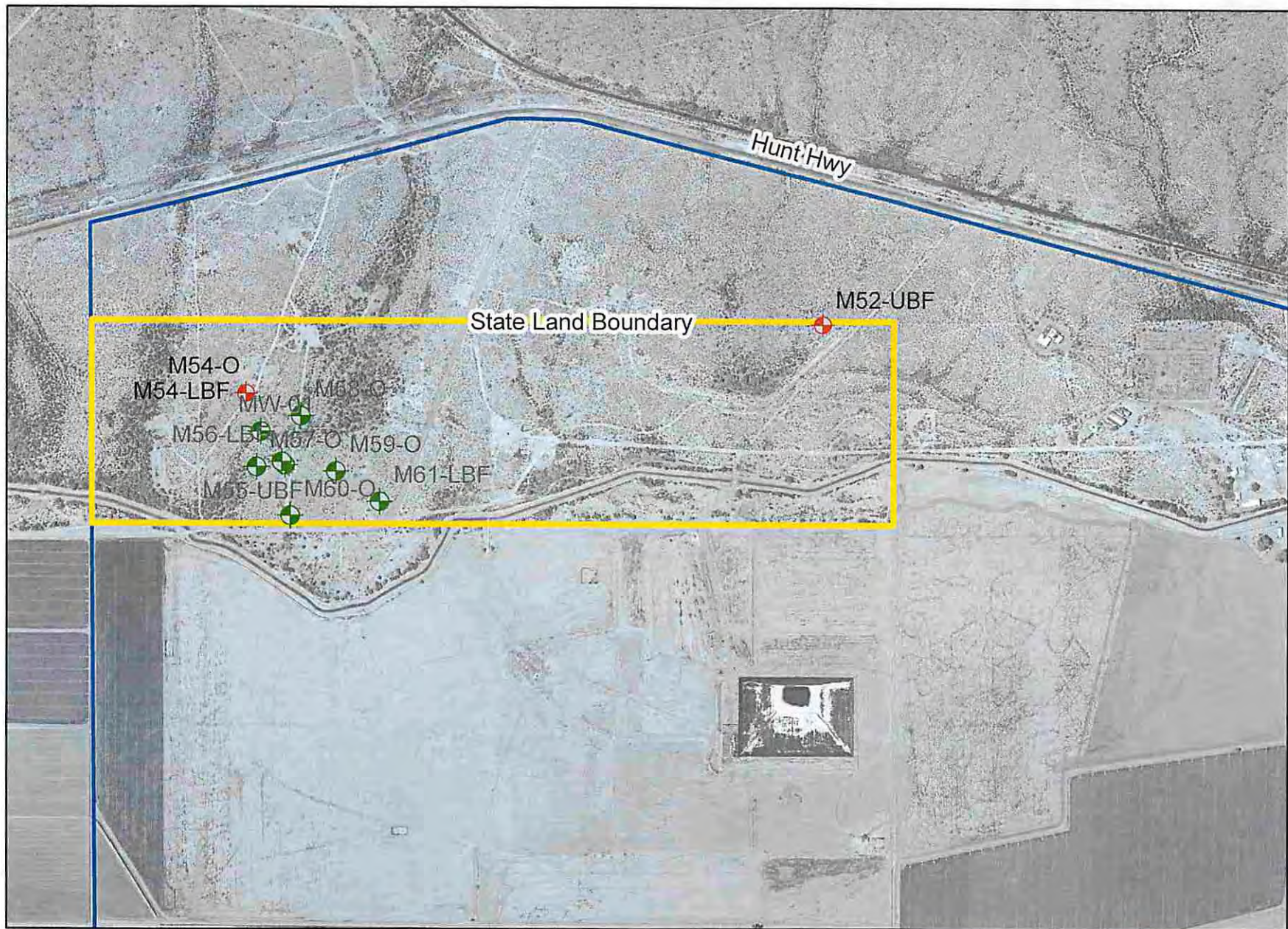
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

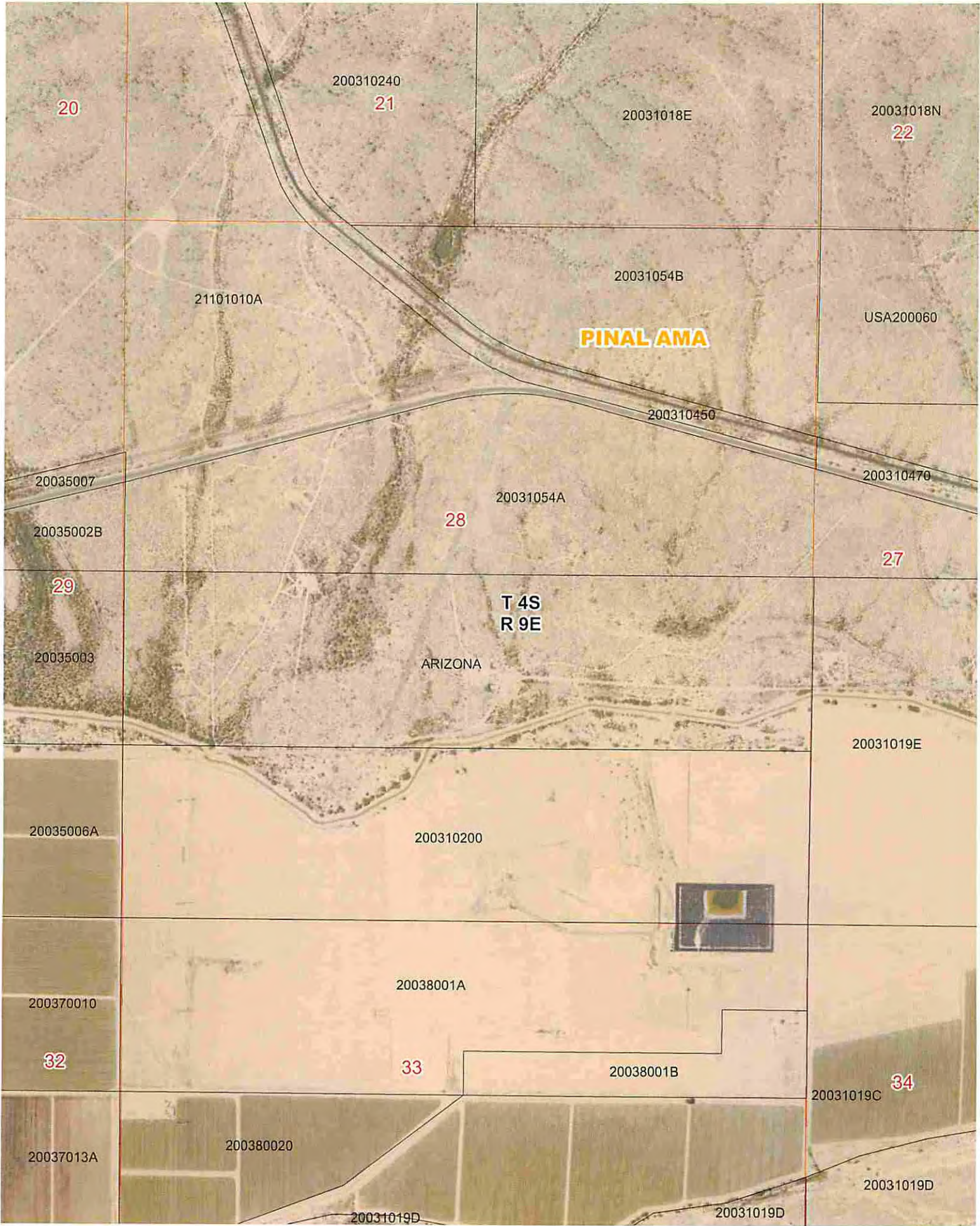
M57-O
WELL CONSTRUCTION DIAGRAM

FLORENCE
COPPER INC.

SCALE: NOT TO SCALE

FIGURE 1





Torren Valdez

From: Ian Ream <IanReam@florencecopper.com>
Sent: Friday, January 13, 2017 9:06 AM
To: Torren Valdez
Subject: Re: Map of monitor well locations

Hi Torren,

The pumps will be QED micro purge. They typically do a liter or two a minute. Very low flow. Looking for discreet interval samples. The flow rate is based on drawdown. The goal is not to draw down the well much more than a half a foot or 1 foot.

Thanks,

Ian Ream
Senior Hydrogeologist
Florence Copper

On Jan 13, 2017, at 8:56 AM, Torren Valdez <tvaldez@azwater.gov> wrote:

Ian,

Would you happen to know the pump capacity (gpm) for the low-flow pumps that will be installed on those monitoring wells?

Thank you,

Torren Valdez
Water Planning & Permitting Division
Arizona Department of Water Resources
602.771.8614

<image002.jpg>

From: Ian Ream [<mailto:IanReam@florencecopper.com>]
Sent: Thursday, January 12, 2017 11:13 AM
To: Torren Valdez <tvaldez@azwater.gov>
Subject: Map of monitor well locations

Hi Torren,

Here is a map with the well locations.

Please don't hesitate to contact me if you need anything else or have any questions.

Cheers,

Ian

Ian Ream Senior Hydrogeologist

<image003.jpg>

Florence Copper Inc.

1575 W. Hunt Highway Florence AZ USA 85132

C 520-840-9604 T 520-374-3984 F 520-374-3999

E ianream@florencecopper.com Web florencecopper.com

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NOTICE

A.R.S. § 41-1030(B), (D), (E) and (F) provide as follows:

B. An agency shall not base a licensing decision in whole or in part on a licensing requirement or condition that is not specifically authorized by statute, rule or state tribal gaming compact. A general grant of authority in statute does not constitute a basis for imposing a licensing requirement or condition unless a rule is made pursuant to that general grant of authority that specifically authorizes the requirement or condition.

D. This section may be enforced in a private civil action and relief may be awarded against the state. The court may award reasonable attorney fees, damages and all fees associated with the license application to a party that prevails in an action against the state for a violation of this section.

E. A state employee may not intentionally or knowingly violate this section. A violation of this section is cause for disciplinary action or dismissal pursuant to the agency's adopted personnel policy.

F. This section does not abrogate the immunity provided by section 12-820.01 or 12-820.02.

ARIZONA DEPARTMENT of WATER RESOURCES
1110 W. Washington St. Suite 310
Engineering and Permits Division
Phoenix, AZ 85007
602-771-8500

NOTICE TO WELL DRILLERS

This is a reminder that a valid drill card be present for the drilling of each and every well constructed on a site.* The problem seems to occur during the construction of a well when an unexpected problem occurs. Either the hole collapses, the hole is dry, a drill bit is lost and can't be recovered, or any number of other situations where the driller feels that he needs to move over and start another well. If you encounter this type of scenario, please be aware drillers do not have the authority to start another well without first obtaining drilling authority for the new well. Please note the following statutes and regulations pertaining to well drilling and construction:

ARIZONA REVISED STATUTE (A.R.S.)

A.R.S. § 45-592.A.

A person may construct, replace or deepen a well in this state only pursuant to this article and section 45-834.01. The drilling of a well may not begin until all requirements of this article and section 45-834.01, as applicable, are met.

A.R.S. § 594.A.

The director shall adopt rules establishing construction standards for new wells and replacement wells, the deepening and abandonment of existing wells and the capping of open wells.

A.R.S. § 600.A

A well driller shall maintain a complete and accurate log of each well drilled.

ARIZONA ADMINISTRATIVE CODE (A.A.C.)

A.A.C. R12-15-803.A.

A person shall not drill or abandon a well, or cause a well to be drilled or abandoned, in a manner which is not in compliance with A.R.S. Title 45, Chapter 2, Article 10, and the rules adopted thereunder.

A.A.C. R12-15-810.A.

A well drilling contractor or single well licensee may commence drilling a well only if the well drilling contractor or licensee has possession of a drilling card at the well site issued by the Director in the name of the well drilling contractor or licensee, authorizing the drilling of the specific well in the specific location.

A.A.C. R12-15-816.F.

In the course of drilling a new well, the well may be abandoned without first filing a notice of intent to abandon and without an abandonment card.

*** THIS REQUIREMENT DOES NOT PERTAIN TO THE DRILLING OF MINERAL EXPLORATION,
GEOTECHNICAL OR HEAT PUMP BOREHOLES**

Transaction Receipt - Success

Arizona Water Resources
Arizona Water Resources
MID:347501639533
1700 W Washington St
Phoenix , AZ 85012
602-771-8454

01/11/2017 04:20PM
Remittance ID
Arizona011117181536095Ald
Transaction ID:
178069995

KELSEY SHERRARD
500 Maint St
WOODLAND, California 95695
United States
Visa - 3420
Approval Code: 040691

Sale
Amount: \$1,800.00

55-226788, 55-226789, 55-226790, 55-226791, 55-226792, 55-226793, 55-226794, 55-226795, 55-226796, 55-226797, 55-226798, 55-226799

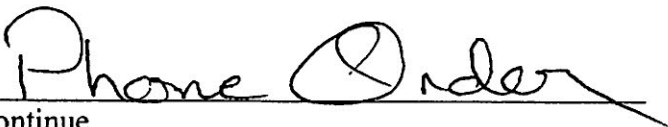
N/A

Cash Reciepts

0

palder@azwater.gov

Cardmember acknowledges
receipt of goods and/or
services in the amount of
the total shown hereon and
agrees to perform the
obligations set forth by the
cardmember's agreement with
the issuer.

Signature 
[click here](#) to continue.

Arizona Department of Water Resources

1110 West Washington Street, Suite 310

Phoenix AZ 85007

Customer:

KELSEY SHERRARD
500 MAIN STREET
WOODLAND, CA 95695

Receipt #: 17-49315
Office: MAIN OFFICE
Receipt Date: 01/11/2017
Sale Type: Mail
Cashier: WRPXA

Item No.	Function Code	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
8505	122221	4439-6F	MONITOR, PIEZOMETER, AIR SPARGING, SOIL VAPOR EXTR		12	150.00	1,800.00
RECEIPT TOTAL:							1,800.00

Payment type: CREDIT CARD

Amount Paid: \$1,800.00

Authorization 178069995

Payment Received Date: 01/11/2017

Notes: Credit card payment for \$1,800.00 is for well registration numbers 55-226788, 55-226789, 55-226790, 55-226791, 55-226792, 55-226793, 55-226794, 55-226795, 55-226796, 55-226797, 55-226798, 55-226799

APPENDIX B

Lithologic Log

H&A-LITHOLOG-NO WELL HA-LIB09-PHX GLB LITHOLOGIC REPORT DATA TEMPLATE+ GDT \\HALEY\ALDRICH\COMMON\129687\GINT\129687-LITH_KF.GPJ 31 Aug 18

HALEY ALDRICH				LITHOLOGIC LOG		M57-O	
Project Production Test Facility, Florence, Arizona				File No. 129687			
Client Florence Copper, Inc.				Sheet No. 1 of 15			
Contractor Cascade Drilling LLC				Cadastral Location D (4-9) 28 CBD			
Drilling Method Conventional Mud Rotary		Land Surface Elevation 1476.77 feet, amsl		Start 3 March 2017			
Borehole Diameter(s) 17.5/10.625 in.		Datum State Plane NAD 83		Finish 10 March 2017			
Rig Make & Model Schramm T685WS		Location N 746,249 E 847,378		H&A Rep. C. Price			
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION		COMMENTS	
0		SW		WELL GRADED SAND (0-35 feet) Primarily fine to coarse sand with ~5% fines and trace gravel to 5 mm. Sand and gravel is angular. Fines have low plasticity, low toughness, are pale brown, and have a weak reaction to HCL. UBFU		Well Registry ID: 55-226790 Surface Completion: Locking Well Vault & Concrete Pad Well casing stickup: 2.2 feet als 	

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
75		SW	75	WELL GRADED SAND with GRAVEL (35-135 feet) Continued
80				
85				
90				
95				
100				
105				
110				
115				
120				
125				
130				
135		SC	135	CLAYEY SAND (135-155 feet) Primarily fine to medium with ~25% fines and trace gravel to 10 mm. Sand and gravel is subangular. Fines have high plasticity, medium toughness, slow dilatancy, very high dry strength, are dark yellowish brown, and have a strong reaction to HCL. UBFU
140				
145				
150				
155		SP-SC	155	POORLY GRADED SAND with GRAVEL and CLAY (155-200 feet) Primarily fine to coarse sand with ~10% fines and ~15% gravel to 6 mm. Sand and gravel is angular. Fines have medium plasticity, medium toughness, are yellowish brown, and have a medium reaction to HCL. UBFU
160				
165				

Seal: Type V neat cement; 0 - 504 feet Fine Sand & Bentonite; 504 - 515 feet

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
		SP-SC	162	<u>POORLY GRADED SAND with GRAVEL and CLAY (155-200 feet)</u> Continued
-165	-1310			
-170	-1305			
-175	-1300			
-180	-1295			
-185	-1290			
-190	-1285			
-195	-1280			
-200		SP	200	<u>POORLY GRADED SAND with GRAVEL (200-255 feet)</u> Primarily medium to coarse sand with ~5% percent fines and ~35% gravel to 14 mm. Sand and gravel is subrounded. Fines have low plasticity, low toughness, are brown, and have a medium reaction to HCL. UBFU
-205	-1275			
-210	-1270			
-215	-1265			
-220	-1260			
-225	-1255			
-230	-1250			
-235	-1245			
-240	-1240			
-245	-1235			
-250	-1230			
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).				M57-O

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
-250	-1225			
-255	-1220	SP- SM	255	POORLY GRADED SAND with SILT and GRAVEL (255-288 feet) Primarily fine to coarse sand with ~10% fines and ~15% gravel to 6 mm. Sand and gravel is subangular. Fines have low plasticity, low toughness, are dark yellowish brown, and have a weak reaction to HCL. UBFU Depth interval adjusted to reflect e-log for MFGU.
-260	-1215			
-265	-1210			
-270	-1205			
-275	-1200			
-280	-1195			
-285	-1190			
-290	-1185	CH	288	FAT CLAY (288-302 feet) Primarily fines with high plasticity. MFGU Middle fine grained unit, confirmed via e-log. Lacks lithologic description.
-295	-1180			
-300	-1175	SC	302	CLAYEY SAND (302-320 feet) Primarily fine to medium sand with ~35% fines and trace gravel to 6 mm. Sand and gravel is subrounded. Fines have high plasticity, medium toughness, are yellowish brown, and have a strong reaction to HCL. LBFU Depth interval adjusted to reflect e-log for MFGU.
-305	-1170			
-310	-1165			
-315	-1160			
-320	-1155	SW- SC	320	WELL GRADED SAND with CLAY (320-340 feet) Primarily fine to coarse sand with ~10% fines and ~10% gravel to 5 mm. Sand and gravel is subangular. Fines have medium plasticity, medium toughness, are dark yellowish brown, and have a medium reaction to HCL. LBFU
-325	-1150			
-330	-1145			
-335				

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
1140				
340		SW	340	WELL GRADED SAND with GRAVEL (340-415 feet) Primarily fine to coarse sand with ~5% fines and ~25% gravel to 6 mm. Sand is subangular, gravel is angular. Fines have low plasticity, low toughness, are brown, and have a weak reaction to HCL. LBFU
1135				
345				
1130				
350				
1125				
355				
1120				
360				
1115				
365				
1110				
370				
1105				
375				
1100				
380				
1095				
385				
1090				
390				
1085				
395				
1080				
400				
1075				
405				
1070				
410				
1065				
415		SW- SC	415	WELL GRADED SAND with CLAY (415-495 feet) Primarily fine to coarse sand with ~10% fines and ~10% gravel to 12 mm. Sand and gravel is subangular. Fines have medium plasticity, low toughness, are dark yellowish brown, and have a strong reaction to HCL. LBFU
1060				
420				
1055			422	

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
-425 -430 -435 -440 -445 -450 -455 -460 -465 -470 -475 -480 -485 -490 -495 -500 -505 -510	1050 1045 1040 1035 1030 1025 1020 1015 1010 1005 1000 995 990 985 980 975 970	SW-SC	495	<p>WELL GRADED SAND with CLAY (415-495 feet) Continued</p> <p>SILTY SAND (495-525 feet) Primarily fine sand with ~15% fines and trace gravel to 5 mm. Sand and gravel is subangular. Fines have medium plasticity, medium toughness, are brown, and have a strong reaction to HCL. LBFU</p>

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
510	965				
515	960				
520	955				
525	950	SW	525	WELL GRADED SAND with GRAVEL (525-545 feet) Primarily fine to coarse sand with ~ 5% fines and ~ 15% gravel to 6 mm. Sand and gravel is subangular. Fines have low plasticity, low toughness, are brown, and have a medium reaction to HCL. LBFU	Filter Pack: 8 - 12 CO Silica Sand; 515 - 1210 feet
530	945				
535	940				
540	935				
545	930		545	DIABASE (545-600 feet) Dark gray to black igneous rock.	Thread Adapter: Stainless Steel, SCH 80 F480 PVC to SCH 40 F480 Mild Steel: 523 feet Well Screen: Nominal 5-inch diameter, SCH 80 PVC Screen (0.020-inch slots); 523 - 1199 feet
550	925				
555	920				
560	915				
565	910				
570	905				
575	900				
580	895				
585	890				
590	885				
595					
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					M57-O

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
880				
600			600	QUARTZ MONZONITE (600-980 feet) Consists of quartz at approximately 35 %, potassium feldspars at approximately 35 %, plagioclase at approximately 25 %, and biotite at approximately 5 %. Chrysocolla fragments and CU mineralization.
875				
605				
870				
610				
865				
615				
860				
620				
855				
625				
850				
630				
845				
635				
840				
640				
835				
645				
830				
650				
825				
655				
820				
660				
815				
665				
810				
670				
805				
675				
800				
680				
795				
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).				M57-O

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
685			683	<u>QUARTZ MONZONITE</u> (600-980 feet) Continued	
790					
690					
785					
695					
780					
700					
775					
705					
770					
710					
765					
715					
760					
720					
755					
725					
750					
730					
745					
735					
740					
740					
735					
745					
730					
750					
725					
755					
720					
760					
715					
765					
710					
			769		

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
-770				QUARTZ MONZONITE (600-980 feet)
-705				Continued
-775				
-700				
-780				
-695				
-785				
-690				
-790				
-685				
-795				
-680				
-800				
-675				
-805				
-670				
-810				
-665				
-815				
-660				
-820				
-655				
-825				
-650				
-830				
-645				
-835				
-640				
-840				
-635				
-845				
-630				
-850				
-625				
-855				
			856	

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
620				QUARTZ MONZONITE (600-980 feet) Continued	
860					
615					
865					
610					
870					
605					
875					
600					
880					
595					
885					
590					
890					
585					
895					
580					
900					
575					
905					
570					
910					
565					
915					
560					
920					
555					
925					
550					
930					
545					
935					
540					
940					
535					
			943		
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					M57-O

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
945	530				
950	525				
955	520				
960	515				
965	510				
970	505				
975	500				
980	495			DIABASE (980-1005 feet) Dark gray to black igneous rock. Trace Cu mineralization.	
985	490				
990	485				
995	480				
1000	475				
1005	470		1005	QUARTZ MONZONITE (1005-1210 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%. Chrysocolla fragments and CU mineralization.	
1010	465				
1015	460				
1020	455				
1025	450				

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
1030			1030	QUARTZ MONZONITE (1005-1210 feet) Continued	
445					
1035					
440					
1040					
435					
1045					
430					
1050					
425					
1055					
420					
1060					
415					
1065					
410					
1070					
405					
1075					
400					
1080					
395					
1085					
390					
1090					
385					
1095					
380					
1100					
375					
1105					
370					
1110					
365					
1115					
360					
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					M57-O

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
			1117	<u>QUARTZ MONZONITE (1005-1210 feet)</u> Continued	
1120	355				
1125	350				
1130	345				
1135	340				
1140	335				
1145	330				
1150	325				
1155	320				
1160	315				
1165	310				
1170	305				
1175	300				
1180	295				
1185	290				
1190	285				
1195	280				
1200	275				

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
1205	270		1204	QUARTZ MONZONITE (1005-1210 feet) Continued	
1210			1210		Total Borehole Depth: Driller = 1210 feet; Geophysical Logging = 1202 feet
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					M57-O

APPENDIX C

Chemical Characterization of Formation Water



May 23, 2018

Barbara Sylvester
Brown & Caldwell
201 E. Washington Suite 500
Phoenix, AZ 85004

TEL (602) 567-3894
FAX -

Work Order No.: 18D0619
Order Name: Florence Copper

RE: PTF

Dear Barbara Sylvester,

Turner Laboratories, Inc. received 2 sample(s) on 04/25/2018 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Kevin Brim
Project Manager

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Order: Florence Copper

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
18D0619-01	R-09	Ground Water	04/23/2018 1555
18D0619-02	TB	Ground Water	04/25/2018 0000

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Case Narrative

The 8015D analysis was performed by TestAmerica Laboratories, Inc. in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

D5 Minimum Reporting Limit (MRL) is adjusted due to sample dilution; analyte was non-detect in the sample.

H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND Not Detected at or above the PQL

PQL Practical Quantitation Limit

DF Dilution Factor

PRL Project Reporting Limit

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7 (4.4)									
Calcium	140		4.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Iron	ND		0.30		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Magnesium	27		3.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Potassium	6.8		5.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Sodium	170		5.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
ICP/MS Dissolved Metals-E 200.8 (5.4)									
Aluminum	ND		0.0800	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Antimony	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Arsenic	0.0016		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Barium	0.071		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Beryllium	ND		0.00050	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Cadmium	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Chromium	0.0051		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Cobalt	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Copper	0.011		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Lead	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Manganese	0.0020		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Nickel	0.0033		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Selenium	ND		0.0025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Thallium	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Zinc	ND		0.040		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
CVAA Dissolved Mercury-E 245.1									
Mercury	ND		0.0010		mg/L	1	04/26/2018 0955	04/26/2018 1639	MH
pH-E150.1									
pH (pH Units)	7.8			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
Temperature (°C)	22			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
ICP/MS Total Metals-E200.8 (5.4)									
Uranium	0.016		0.00050		mg/L	1	04/27/2018 1230	04/30/2018 1348	MH

Client: Brown & Caldwell

Project: PTF

Work Order: 18D0619

Lab Sample ID: 18D0619-01

Client Sample ID: R-09

Collection Date/Time: 04/23/2018 1555

Matrix: Ground Water

Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Anions by Ion Chromatography-E300.0 (2.1)									
Chloride	310		25		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Fluoride	ND		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrate (As N)	8.8		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrite (As N)	ND		0.10		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Sulfate	190		130		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Cyanide-E335.4									
Cyanide	ND		0.10		mg/L	1	04/26/2018 0845	04/30/2018 1545	AP
Alkalinity-SM2320B									
Alkalinity, Bicarbonate (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Carbonate (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Hydroxide (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Phenolphthalein (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Total (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Specific Conductance-SM2510 B									
Conductivity	1700		0.20		µmhos/cm	2	05/09/2018 1315	05/09/2018 1330	AP
Total Dissolved Solids (Residue, Filterable)-SM2540 C									
Total Dissolved Solids (Residue, Filterable)	1000		20		mg/L	1	04/26/2018 0826	05/01/2018 1600	EJ
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: 4-Bromofluorobenzene	95	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: Dibromofluoromethane	101	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: Toluene-d8	77	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP

Client:

Project:

Work Order:

Lab Sample ID:

Brown & Caldwell
PTF
18D0619
18D0619-02

Client Sample ID: TB

Collection Date/Time: 04/25/2018 0000

Matrix: Ground Water

Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: 4-Bromofluorobenzene	101	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: Dibromofluoromethane	110	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: Toluene-d8	103	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804269 - E 245.1										
Blank (1804269-BLK1)				Prepared & Analyzed: 04/26/2018						
Mercury	ND	0.0010	mg/L							
LCS (1804269-BS1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0049	0.0010	mg/L	0.005000		98	85-115			
LCS Dup (1804269-BSD1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0048	0.0010	mg/L	0.005000		95	85-115	2	20	
Matrix Spike (1804269-MS1)				Source: 18D0394-01			Prepared & Analyzed: 04/26/2018			
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	97	85-115			
Matrix Spike Dup (1804269-MSD1)				Source: 18D0394-01			Prepared & Analyzed: 04/26/2018			
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	96	85-115	1	20	
Batch 1804292 - E200.8 (5.4)										
Blank (1804292-BLK1)				Prepared & Analyzed: 04/30/2018						
Uranium	ND	0.00050	mg/L							
LCS (1804292-BS1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115			
LCS Dup (1804292-BSD1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115	0.2	20	
Matrix Spike (1804292-MS1)				Source: 18D0614-01			Prepared & Analyzed: 04/30/2018			
Uranium	0.051	0.00050	mg/L	0.05000	0.0015	99	70-130			
Batch 1805051 - E 200.7 (4.4)										
Blank (1805051-BLK1)				Prepared & Analyzed: 05/04/2018						
Calcium	ND	4.0	mg/L							
Iron	ND	0.30	mg/L							
Magnesium	ND	3.0	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1805051-BS1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		109	85-115			
Iron	1.0	0.30	mg/L	1.000		104	85-115			
Magnesium	10	3.0	mg/L	10.00		105	85-115			
Potassium	10	5.0	mg/L	10.00		105	85-115			
Sodium	10	5.0	mg/L	10.00		105	85-115			
LCS Dup (1805051-BSD1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		110	85-115	1	20	
Iron	1.0	0.30	mg/L	1.000		105	85-115	0.5	20	
Magnesium	10	3.0	mg/L	10.00		105	85-115	0.06	20	
Potassium	10	5.0	mg/L	10.00		105	85-115	0.05	20	
Sodium	11	5.0	mg/L	10.00		109	85-115	4	20	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805051 - E 200.7 (4.4)										
Matrix Spike (1805051-MS1)		Source: 18D0619-01		Prepared & Analyzed: 05/04/2018						
Calcium	150	4.0	mg/L	10.00	140	59	70-130			M3
Iron	1.1	0.30	mg/L	1.000	0.028	105	70-130			
Magnesium	38	3.0	mg/L	10.00	27	108	70-130			
Potassium	17	5.0	mg/L	10.00	6.8	105	70-130			
Sodium	170	5.0	mg/L	10.00	170	30	70-130			M3
Matrix Spike (1805051-MS2)		Source: 18E0021-01		Prepared & Analyzed: 05/04/2018						
Calcium	64	4.0	mg/L	10.00	54	103	70-130			
Iron	1.0	0.30	mg/L	1.000	0.0060	101	70-130			
Magnesium	21	3.0	mg/L	10.00	11	99	70-130			
Potassium	15	5.0	mg/L	10.00	4.7	104	70-130			
Sodium	99	5.0	mg/L	10.00	90	87	70-130			
Batch 1805069 - E 200.8 (5.4)										
Blank (1805069-BLK1)		Prepared & Analyzed: 05/07/2018								
Aluminum	ND	0.0400	mg/L							
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Barium	ND	0.00050	mg/L							
Beryllium	ND	0.00025	mg/L							
Cadmium	ND	0.00025	mg/L							
Chromium	ND	0.00050	mg/L							
Cobalt	ND	0.00025	mg/L							
Copper	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Manganese	ND	0.00025	mg/L							
Nickel	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Zinc	ND	0.040	mg/L							
LCS (1805069-BS1)		Prepared & Analyzed: 05/07/2018								
Aluminum	0.104	0.0400	mg/L	0.1000		104	85-115			
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115			
Barium	0.050	0.00050	mg/L	0.05000		100	85-115			
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115			
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115			
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115			
Cobalt	0.051	0.00025	mg/L	0.05000		101	85-115			
Copper	0.051	0.00050	mg/L	0.05000		103	85-115			
Lead	0.049	0.00050	mg/L	0.05000		98	85-115			
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115			
Nickel	0.051	0.00050	mg/L	0.05000		102	85-115			
Selenium	0.051	0.0025	mg/L	0.05000		103	85-115			
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115			
Zinc	0.10	0.040	mg/L	0.1000		101	85-115			

Client: Brown & Caldwell
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805069 - E 200.8 (5.4)										
LCS Dup (1805069-BSD1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.115	0.0400	mg/L	0.1000		115	85-115	10	20	
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115	0.7	20	
Arsenic	0.050	0.00050	mg/L	0.05000		101	85-115	0.8	20	
Barium	0.051	0.00050	mg/L	0.05000		102	85-115	1	20	
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115	0.2	20	
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115	0.2	20	
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115	0.4	20	
Cobalt	0.050	0.00025	mg/L	0.05000		101	85-115	0.5	20	
Copper	0.052	0.00050	mg/L	0.05000		105	85-115	2	20	
Lead	0.049	0.00050	mg/L	0.05000		98	85-115	0.1	20	
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115	0.09	20	
Nickel	0.051	0.00050	mg/L	0.05000		103	85-115	0.8	20	
Selenium	0.052	0.0025	mg/L	0.05000		104	85-115	2	20	
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115	0.06	20	
Zinc	0.10	0.040	mg/L	0.1000		104	85-115	3	20	
Matrix Spike (1805069-MS1)				Source: 18D0693-01	Prepared & Analyzed: 05/07/2018					
Aluminum	0.239	0.0400	mg/L	0.1000	0.166	74	70-130			
Antimony	0.045	0.00050	mg/L	0.05000	0.00024	90	70-130			
Arsenic	0.056	0.00050	mg/L	0.05000	0.0035	104	70-130			
Barium	0.16	0.00050	mg/L	0.05000	0.12	94	70-130			
Beryllium	0.045	0.00025	mg/L	0.05000	0.000029	90	70-130			
Cadmium	0.047	0.00025	mg/L	0.05000	ND	94	70-130			
Chromium	0.049	0.00050	mg/L	0.05000	0.00052	98	70-130			
Cobalt	0.048	0.00025	mg/L	0.05000	0.00097	95	70-130			
Copper	0.051	0.00050	mg/L	0.05000	0.0020	98	70-130			
Lead	0.047	0.00050	mg/L	0.05000	0.00016	94	70-130			
Manganese	0.054	0.00025	mg/L	0.05000	0.0075	94	70-130			
Nickel	0.049	0.00050	mg/L	0.05000	0.0018	94	70-130			
Selenium	0.057	0.0025	mg/L	0.05000	ND	114	70-130			
Thallium	0.048	0.00050	mg/L	0.05000	0.000038	96	70-130			
Zinc	0.11	0.040	mg/L	0.1000	ND	109	70-130			

Client: Brown & Caldwell
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804261 - SM2540 C										
Duplicate (1804261-DUP1)		Source: 18D0606-01		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	630	20	mg/L		630			0.3	5	
Duplicate (1804261-DUP2)		Source: 18D0606-02		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	610	20	mg/L		620			0.8	5	
Batch 1804268 - E335.4										
Blank (1804268-BLK1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	ND	0.10	mg/L							
LCS (1804268-BS1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	2.0	0.10	mg/L	2.000		101	90-110			
LCS Dup (1804268-BSD1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	2.0	0.10	mg/L	2.000		101	90-110	0.1	20	
Matrix Spike (1804268-MS1)		Source: 18D0602-03		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.1	0.10	mg/L	2.000	ND	103	90-110			
Matrix Spike Dup (1804268-MSD1)		Source: 18D0602-03		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000	ND	98	90-110	5	20	
Batch 1804272 - E150.1										
Duplicate (1804272-DUP1)		Source: 18D0662-02		Prepared & Analyzed: 04/26/2018						
pH (pH Units)	7.8		-		7.8			0.1	200	H5
Temperature (°C)	21		-		21			2	200	H5
Batch 1805027 - SM2320B										
LCS (1805027-BS1)		Prepared & Analyzed: 05/03/2018								
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110			
LCS Dup (1805027-BSD1)		Prepared & Analyzed: 05/03/2018								
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110	0	10	
Matrix Spike (1805027-MS1)		Source: 18D0606-02		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	96	85-115			
Matrix Spike Dup (1805027-MSD1)		Source: 18D0606-02		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	95	85-115	0.5	10	
Batch 1805103 - SM2510 B										
LCS (1805103-BS1)		Prepared & Analyzed: 05/09/2018								
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200			
LCS Dup (1805103-BSD1)		Prepared & Analyzed: 05/09/2018								
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200	0.7	200	
Duplicate (1805103-DUP1)		Source: 18E0192-01		Prepared & Analyzed: 05/09/2018						
Conductivity	4.0	0.10	µmhos/cm		4.0			0	10	

Client: Brown & Caldwell
Project: PTF
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805074 - SW8260B										
Blank (1805074-BLK1)				Prepared & Analyzed: 05/07/2018						
Benzene	ND	0.50	ug/L							
Carbon disulfide	ND	2.0	ug/L							
Ethylbenzene	ND	0.50	ug/L							
Toluene	ND	0.50	ug/L							
Xylenes, Total	ND	1.5	ug/L							
Surrogate: 4-Bromofluorobenzene	25.0		ug/L	25.00		100	70-130			
Surrogate: Dibromofluoromethane	26.9		ug/L	25.00		107	70-130			
Surrogate: Toluene-d8	25.1		ug/L	25.00		100	70-130			
LCS (1805074-BS1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	29		ug/L	25.00		114	70-130			
Benzene	27		ug/L	25.00		109	70-130			
Chlorobenzene	29		ug/L	25.00		115	70-130			
Toluene	25		ug/L	25.00		101	70-130			
Trichloroethene	26		ug/L	25.00		103	70-130			
Surrogate: 4-Bromofluorobenzene	24.6		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	25.6		ug/L	25.00		102	70-130			
Surrogate: Toluene-d8	24.8		ug/L	25.00		99	70-130			
LCS Dup (1805074-BSD1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00		110	70-130	4	30	
Benzene	26		ug/L	25.00		104	70-130	5	30	
Chlorobenzene	26		ug/L	25.00		105	70-130	9	30	
Toluene	24		ug/L	25.00		96	70-130	5	30	
Trichloroethene	25		ug/L	25.00		98	70-130	4	30	
Surrogate: 4-Bromofluorobenzene	24.4		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	26.1		ug/L	25.00		104	70-130			
Surrogate: Toluene-d8	25.1		ug/L	25.00		100	70-130			
Matrix Spike (1805074-MS1)				Source: 18D0582-02	Prepared & Analyzed: 05/07/2018					
1,1-Dichloroethene	27		ug/L	25.00	0.070	109	70-130			
Benzene	26		ug/L	25.00	0.020	104	70-130			
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130			
Toluene	27		ug/L	25.00	3.5	95	70-130			
Trichloroethene	24		ug/L	25.00	0.040	97	70-130			
Surrogate: 4-Bromofluorobenzene	24.4		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	26.4		ug/L	25.00		106	70-130			
Surrogate: Toluene-d8	24.9		ug/L	25.00		100	70-130			
Matrix Spike Dup (1805074-MSD1)				Source: 18D0582-02	Prepared & Analyzed: 05/07/2018					
1,1-Dichloroethene	27		ug/L	25.00	0.070	108	70-130	0.8	30	
Benzene	25		ug/L	25.00	0.020	101	70-130	2	30	
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	0.3	30	
Toluene	27		ug/L	25.00	3.5	95	70-130	0.1	30	
Trichloroethene	24		ug/L	25.00	0.040	95	70-130	2	30	
Surrogate: 4-Bromofluorobenzene	24.7		ug/L	25.00		99	70-130			
Surrogate: Dibromofluoromethane	26.4		ug/L	25.00		106	70-130			
Surrogate: Toluene-d8	25.3		ug/L	25.00		101	70-130			

Client: Brown & Caldwell
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804245 - E300.0 (2.1)										
Blank (1804245-BLK1)				Prepared & Analyzed: 04/25/2018						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1804245-BS1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		92	90-110			
Fluoride	2.0	0.50	mg/L	2.000		101	90-110			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000		95	90-110			
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500		92	90-110			
Sulfate	12	5.0	mg/L	12.50		96	90-110			
LCS Dup (1804245-BSD1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		94	90-110	2	10	
Fluoride	2.0	0.50	mg/L	2.000		101	90-110	0.4	10	
Nitrogen, Nitrate (As N)	4.9	0.50	mg/L	5.000		98	90-110	3	10	
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		95	90-110	3	10	
Sulfate	12	5.0	mg/L	12.50		98	90-110	3	10	
Matrix Spike (1804245-MS1)		Source: 18D0613-08		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	89	80-120			
Matrix Spike (1804245-MS2)		Source: 18D0625-01		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000	0.46	92	80-120			
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120			
Matrix Spike (1804245-MS3)		Source: 18D0614-01RE1		Prepared & Analyzed: 04/26/2018						
Chloride	17		mg/L	12.50	6.4	88	80-120			
Sulfate	28		mg/L	12.50	18	85	80-120			
Matrix Spike Dup (1804245-MSD1)		Source: 18D0613-08		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	0.4	10	
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	90	80-120	0.6	10	
Matrix Spike Dup (1804245-MSD2)		Source: 18D0625-01		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000	0.46	92	80-120	0.2	10	
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	0.4	10	
Matrix Spike Dup (1804245-MSD3)		Source: 18D0614-01RE1		Prepared & Analyzed: 04/26/2018						
Chloride	18		mg/L	12.50	6.4	89	80-120	0.6	10	
Sulfate	29		mg/L	12.50	18	86	80-120	0.6	10	



TURNER WORK ORDER # 18D0619 DATE 4/23/18 PAGE 1 OF 1

Page 13 of 32

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Phoenix

4625 East Cotton Ctr Blvd

Suite 189

Phoenix, AZ 85040

Tel: (602)437-3340

TestAmerica Job ID: 550-101943-1

Client Project/Site: 18D0619

For:

Turner Laboratories, Inc.

2445 North Coyote Drive

Suite 104

Tucson, Arizona 85745

Attn: Kevin Brim



Authorized for release by:

5/16/2018 12:23:25 PM

Ken Baker, Project Manager II

(602)659-7624

ken.baker@testamericainc.com

LINKS

Review your project
results through

TotalAccess

Have a Question?



Visit us at:

www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Q9	Insufficient sample received to meet method QC requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-101943-1

Comments

No additional comments.

Receipt

The sample was received on 4/27/2018 10:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8° C.

GC Semi VOA

Method(s) 8015D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD) associated with preparation batch 550-145985 and analytical batch 550-146884. Affected samples have been added a Q9 qualifier. 18D0619-01 (550-101943-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-101943-1	18D0619-01	Water	04/23/18 15:55	04/27/18 10:50

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Detection Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01 Lab Sample ID: 550-101943-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
ORO (C22-C32)	0.21	Q9	0.20	mg/L	1		8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Date Collected: 04/23/18 15:55

Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1

Matrix: Water

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	0.21	Q9	0.20	mg/L		04/30/18 14:16	05/10/18 23:29	1
DRO (C10-C22)	ND	Q9	0.10	mg/L		04/30/18 14:16	05/10/18 23:29	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	79		10 - 150			04/30/18 14:16	05/10/18 23:29	1

Surrogate Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OTPH (10-150)
550-101943-1	18D0619-01	79
LCS 550-145985/2-A	Lab Control Sample	79
LCSD 550-145985/3-A	Lab Control Sample Dup	79
MB 550-145985/1-A	Method Blank	65

Surrogate Legend

OTPH = o-Terphenyl (Surr)

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

QC Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 550-145985/1-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 145985

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	ND		0.20	mg/L		04/30/18 14:15	05/11/18 11:16	1
DRO (C10-C22)	ND		0.10	mg/L		04/30/18 14:15	05/11/18 11:16	1
Surrogate	MB %Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	65		10 - 150			04/30/18 14:15	05/11/18 11:16	1

Lab Sample ID: LCS 550-145985/2-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 145985

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
ORO (C22-C32)	1.60	1.59		mg/L		99	69 - 107
DRO (C10-C22)	0.400	0.450		mg/L		113	42 - 133
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
o-Terphenyl (Surr)	79		10 - 150				

Lab Sample ID: LCSD 550-145985/3-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 145985

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
ORO (C22-C32)	1.60	1.59		mg/L		100	69 - 107	0	20
DRO (C10-C22)	0.400	0.447		mg/L		112	42 - 133	1	22
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl (Surr)	79		10 - 150						

TestAmerica Phoenix

QC Association Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

GC Semi VOA

Prep Batch: 145985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	3510C	
MB 550-145985/1-A	Method Blank	Total/NA	Water	3510C	
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 146884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	8015D	145985
MB 550-145985/1-A	Method Blank	Total/NA	Water	8015D	145985
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	8015D	145985
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	8015D	145985

Lab Chronicle

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01
Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			145985	04/30/18 14:16	REM	TAL PHX
Total/NA	Analysis	8015D		1	146884	05/10/18 23:29	TC1	TAL PHX

Laboratory References:
TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

- 1
- 2
- 3
- 4
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Accreditation/Certification Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-18
Analysis Method	Prep Method	Matrix	Analyte	

- 1
- 2
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- 11
- 12
- 13
- 14
- 15

Method Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method	Method Description	Protocol	Laboratory
8015D	Diesel Range Organics (DRO) (GC)	SW846	TAL PHX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL PHX

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

101943

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Kevin Brim

RECEIVING LABORATORY:

TestAmerica Phoenix
4625 East Cotton Center Boulevard Suite 189
Phoenix, AZ 85540
Phone : (602) 437-3340
Fax:
Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis

Expires

Laboratory ID

Comments

Sample ID: 18D0619-01 Drinking Water Sampled: 04/23/2018 15:55

8015D Sub

04/30/2018 15:55

8015D DRO and ORO Paramaters Only

Containers Supplied:

8015D Sub

o-Terphenyl
C10-C32 (Total)
C22-C32 (Oil Range Organics)
C10-C22 (Diesel Range Organics)
C6-C10 (Gasoline Range Organics)

550-101943 Chain of Custody



TA-PHX

3.8 L
LPS
GVR

Released By

Date

Received By

Date

Released By

Date

Received By

Date

Login Sample Receipt Checklist

Client: Turner Laboratories, Inc.

Job Number: 550-101943-1

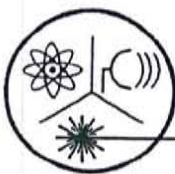
Login Number: 101943

List Source: TestAmerica Phoenix

List Number: 1

Creator: Gravlin, Andrea

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.



Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

(480) 897-9459

Website: www.radsafe.com

FAX (480) 892-5446

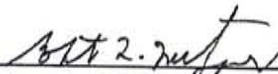
Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Analysis Completed: May 22, 2018

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
18D0619-01	17.7 ± 0.9	12.9 ± 1.2	4.8 ± 1.5	3.1 ± 0.3	3.1 ± 0.4	6.2 ± 0.5

Date of Analysis	5/2/2018	5/21/2018	5/21/2018	5/4/2018	5/4/2018	5/4/2018
------------------	----------	-----------	-----------	----------	----------	----------


 Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
 Date
 Laboratory License Number AZ0462



Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

Website: www.radsafe.com

(480) 897-9459

FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018

Sample Received: May 01, 2018

Uranium Analysis Date: May 21, 2018

Sample No.	^{238}U	^{235}U	^{234}U	Total	
18D0619-01	6.0 ± 0.6	0.280 ± 0.004	6.6 ± 0.6	12.9 ± 1.2	Activity (pCi/L)
	17.9 ± 1.7	0.131 ± 0.002	0.00106 ± 0.00010	18.0 ± 1.7	Content ($\mu\text{g/L}$)
	Comments:				

Robert L. Metzger
Robert L. Metzger, Ph.D., C.H.P.

5/22/2018

Date

Laboratory License Number AZ0462

Arizona Department of Environmental Quality
Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report
 Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04

PWS Name: _____

April 23, 2018 15:55 (24 hour clock)

Sample Date

Sample Time

Owner/Contact Person

Owner/Contact Fax Number

Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # _____**Compliance Sample Type:**☐

Reduced Monitoring

Date Q1 collected: _____

☐

Quarterly

Date Q2 collected: _____

☐

Composite of four quarterly samples

Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	5/21/2018	4.8 ± 1.5	
600/00-02		3 pCi/L	Gross Alpha	4002	5/2/2018	17.7 ± 0.9	
7500 - Rn			Radon	4004			
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	5/21/2018	18.0 ± 1.7 µg/L	
			Uranium 234	4007	5/21/2018	0.00106 ± 0.00010	
			Uranium 235	4008	5/21/2018	0.131 ± 0.002	
			Uranium 238	4009	5/21/2018	17.9 ± 1.7	
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/4/2018	6.2 ± 0.5	X
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/4/2018	3.1 ± 0.3	
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/4/2018	3.1 ± 0.4	

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

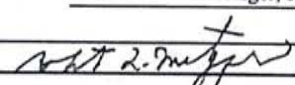
Specimen Number: RSE60312

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 18D0619-01

Authorized Signature: 

Date Public Water System Notified: _____

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

SENDING LABORATORY:

Turner Laboratories, Inc.
 2445 N. Coyote Drive, Ste #104
 Tucson, AZ 85745
 Phone: 520.882.5880
 Fax: 520.882.9788
 Project Manager: Kevin Brim

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
 3245 N. Washington St.
 Chandler, AZ 85225-1121
 Phone : (480) 897-9459
 Fax: (480) 892-5446
 Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
<hr/>			
Sample ID: 18D0619-01 Drinking Water Sampled: 04/23/2018 15:55			
Radiochemistry, Gross Alpha	10/20/2018 15:55		Analyze Uranium and Adjusted Alpha if G. Alpha is > 12
Radiochemistry, Radium 226/228	05/23/2018 15:55		
Containers Supplied:			

4130/18

Released By

Date

Received By

Date

Released By

Date

Received By

Date

APPENDIX D

Well Completion Documentation

PIPE TALLY

Project Name.: FLI	Project No.: 129687-002
Well No.: M57-0	Date: 3-9-17
Location: Florence	Pipe Tally for: Well Install
Total Depth: 1210	Geologist: C Price

Type of Connections: ☐ Welded ☐ T+C ☒ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type
1	✓	0.52	0.52	PVC-Cap	31	✗	19.99	575.57	PVC-0.020 screen
2	✗	5.00	5.52	PVC-0.020 screen	32	✓	19.98	595.55	
3	✗	10.02	15.54		33	✗	20.00	615.55	
4	✓	20.02	35.56		34	✓	20.00	635.55	
5	✗	20.01	55.57		35	✗	19.99	655.54	
6	✓	19.95	75.52		36	✓	19.97	675.51	
7	✗	19.99	95.51		37	✗	1.28	676.79	PVC/Steel adapter
8	✓	20.01	115.52		38	✓	19.98	696.77	Steel Riser
9	✗	20.01	135.53		39	✓	20.00	716.77	
10	✓	20.00	155.53		40	✗	19.99	736.76	
11	✗	20.00	175.53		41	✓	20.00	756.76	
12	✓	19.97	195.50		42	✗	20.00	776.76	
13	✗	20.01	215.51		43	✓	19.98	796.74	
14	✓	20.01	235.52		44	✓	19.99	816.73	
15	✗	20.00	255.52		45	✗	20.00	836.73	
16	✓	20.00	275.52		46	✓	19.99	856.72	
17	✗	19.98	295.50		47	✓	19.99	876.71	
18	✓	20.02	315.52		48	✗	20.00	896.71	
19	✗	20.01	335.53		49	✓	19.99	916.70	
20	✓	20.00	355.53		50	✓	20.00	936.70	
21	✗	20.00	375.53		51	✗	19.99	956.69	
22	✓	20.01	395.54		52	✓	19.98	976.67	
23	✗	20.02	415.56		53	✓	19.99	996.66	
24	✓	20.00	435.56		SUMMARY OF TALLY Total Length tallied: 1201.62 Casing Stick-Up: 2.1 Length of Casing Cut-Off: 0 Bottom of Well: 1199.52 Screened Interval: 1199-522.73 Total Screen in Hole: 676.27				
25	✗	20.01	455.57						
26	✓	20.00	475.57						
27	✗	20.00	495.57						
28	✓	20.00	515.57						
29	✗	20.01	535.58						
30	✓	20.00	555.58	✓					

Notes:

5" SCH 80

Screen - PVC 0020 slot

PVC End cap

PVC → Steel Adapter

Risers - Mild Steel, ASTM A53 Gr. A/A135/A75

✗ = Centralizer at bottom of pipe.

HALEY
ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: <u>FCE</u>	Project #: <u>129687-002</u>	Date: <u>3-10-17</u>	
Well No.: <u>MS7-0</u>	Geologist: <u>KFORD, L. CANDREVA</u>		

ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]: <u>1210</u> feet (drilled)	Total Cased Depth: <u>1200</u> feet
Borehole Diameter [D]: <u>10.625</u> inches	Rat Hole Volume [R=(D ²) 0.005454*L]: <u>4.8</u> Ft ³
Screen Length [L _s]: <u>675.5</u> feet	Rat Hole Length [L _r]: <u>~8</u> feet
Screen Diameter [d _s]: <u>5.56</u> inches	Camera Tube Length [L _{ct}]: <u>-</u> feet
Casing Length [L _c]: <u>524.5</u> feet	Camera Tube Diameter [d _{ct}]: <u>-</u> inches
Casing Diameter [d _c]: <u>5.56</u> inches	SURF CSG ANN. VOL: <u>0.90</u> Ft ³ /Ft

Screen Annular Volume (A _s): (D ² -d _s ²) 0.005454 =	<u>0.45</u> Ft ³ /Lin. Ft
Casing Annular Volume (A _c): (D ² -d _c ²) 0.005454 =	<u>0.45</u> Ft ³ /Lin. Ft
Casing/Cam. Tube Annular Volume (A _{ct}): (D ² -d _{ct} ²) 0.005454 =	<u>N/A</u> Ft ³ /Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet

¹ Volume of bag (Ft³) = bag weight/100

² Calculated depth = Previous Calculated depth - (v/A)

Bentonite Sack = 0.69 ft³

Silica Sand Super Sack = 3000 lbs.

No.	✓	Weight of Bag (lbs.)	Volume of Bag ¹ (v) (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bls)	Tagged Depth (ft bls)	Comments
1	✓	3000	30	30	1141	-	NO. 8-12 SILICA SAND.
2	✓	3000	30	60	1075	1041	
3	✓	3000	30	90	974	-	
4	✓	3000	30	120	908	904	
5	✓	3000	30	150	837	-	
6	✓	3000	30	180	771	754	
7	✓	3000	30	210	687	-	

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FCI

Project No.: 129687-002

Geologist: KFORD + L. CANDREWA

Well No.: M57-0

Date: 3-10-17

[illegible]

Notes: * 3 5-GAL BUCKETS 8x12 SAND
** 20 5-GAL BUCKETS 8x12 SAND



53673635

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D11/4111	1317	1323	217				

Customer Code: 7 Customer Name: CEMEX COPPER INC

Customer Job Number: FLORENCE WELL

Order Code / Date: 03/10/17

Project Code: 304 Project Name: FLORENCE WELL

Project P.O. Number: NO

Order P.O. Number: NO

Ticket Date: 03/10/17 Delivery Address: HUNT HIGHWAY

CEMEX ONE

Map Page: 1 Map/Row/Column: 1

Delivery Instructions: HUNT HWY & E/ FELIX RD

Dispatcher: ash

Ticket Number:
44044829

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
	11"			SMITH, MICHAEL	SHILLBLDNG. OTHER

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
0.00	0.00	12.00	1333049	TYPE II/V SLURRY 21 SK GNT/W YDS			
				LEGACY MATERIAL NO:			

MAR 10 '17 13:17

1.00
1.00
1.001247818 FUEL SURCHARGE ADJ
1202749 ENVIRONMENTAL FEE
1572392 FREIGHT_NON_TAXABLE_ARIZONA

<input type="checkbox"/> Cash	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:
<input type="checkbox"/> Check				
<input type="checkbox"/> Charge				

Comments:

WATER ADDED: _____ GAL YARDS IN DRUM: _____
WHEN ADDED: _____

SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:

SIGNATURE

☐ LOAD WAS TESTED BY: _____

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING:** Product may cause skin and/or eye irritation. **CAUTION:** Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE:

Michael Reynolds

LOAD NUM: 1

68UNIVERSAL

INVOICE



Customer Code:	Customer Name:	Customer Job Number:	Order Code / Date:
3181157	FLORENCE COPPER INC	FLORENCE WELL	6464 03/10/17
Project Code:	Project Name:	Project P.O. Number:	Order P.O. Number:
41097304	FLORENCE WELL	NO	NO
Ticket Date:	Delivery Address:		Map Page: Map/Row/Column:
03/10/17	1575 W HUNT HIGHWAY	CEMEX ONE	PIN PINMY201
Delivery Instructions:			Dispatcher:
HUNT HWY & E/ FELIX RD			knash
			Ticket Number:
			44044877

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
6.00	12.00	12.00	1333049	TYPE II/V SLURRY 21 SK CMT/W YD3 LEGACY MATERIAL NO:			
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA_			

<input type="checkbox"/> Cash	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:
<input type="checkbox"/> Check				
<input type="checkbox"/> Charge				
Comments:		WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED. <div style="text-align: right;">SIGNATURE</div> CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST: <div style="text-align: right;">SIGNATURE</div> <input type="checkbox"/> LOAD WAS TESTED BY: _____		

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING:** Product may cause skin and/or eye irritation. **CAUTION:** Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE:

① Michael Reynolds

68UNIVERSAL

PREV TRK: 10032050 SMITH, MICHAEL

INVOICE

LOAD NUM: 2

APPENDIX E

Geophysical Logs



Southwest Exploration Services, LLC

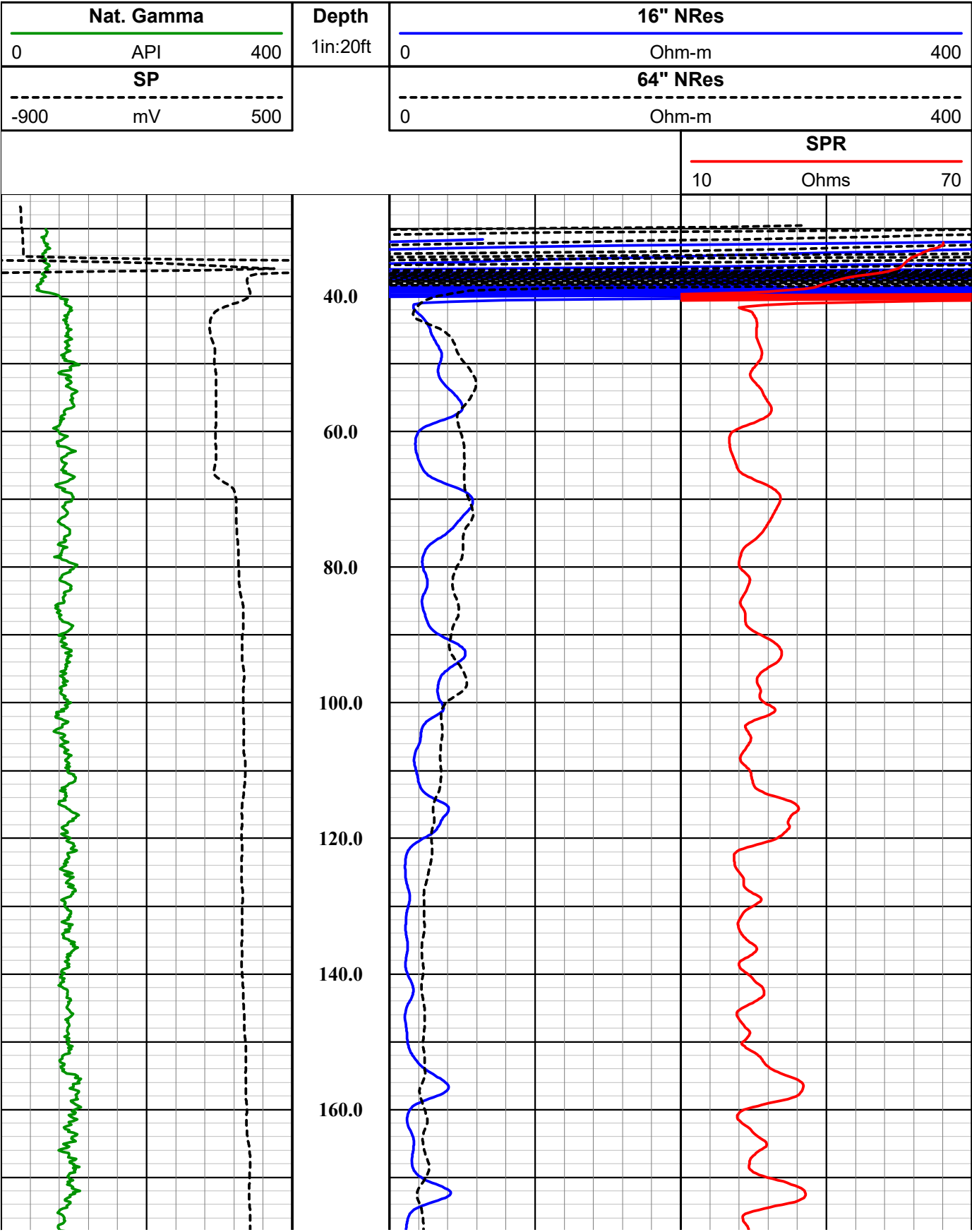
borehole geophysics & video services

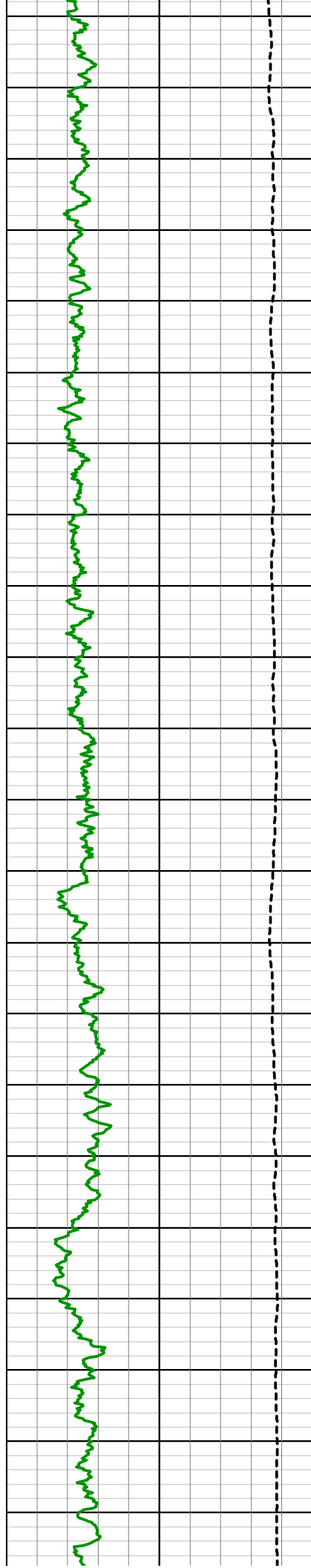
COMPANY FLORENCE COPPER	
WELL ID M57-0	
FIELD FLORENCE COPPER	
COUNTY PINAL	STATE ARIZONA
TYPE OF LOGS: E-LOGS MORE: NAT. GAMMA	
LOCATION	
SEC TWP RGE	
PERMANENT DATUM	ELEVATION
LOG MEAS. FROM GROUND LEVEL	ABOVE PERM. DATUM
DRILLING MEAS. FROM GROUND LEVEL	
DATE 3-9-17	TYPE FLUID IN HOLE MUD
RUN No 2	MUD WEIGHT N/A
TYPE LOG E-LOGS - NAT. GAMMA	VISCOSITY N/A
DEPTH-DRILLER 1210 FT.	LEVEL FULL
DEPTH-LOGGER 1202 FT.	MAX. REC. TEMP. 32.72 DEG. C
BTM LOGGED INTERVAL 1202 FT.	IMAGE ORIENTED TO: N/A
TOP LOGGED INTERVAL SURFACE	SAMPLE INTERVAL 0.2 FT
DRILLER / RIG# NATIONAL DRILLING	LOGGING TRUCK TRUCK #310
RECORDED BY / Logging Eng. A. OLSON / E. TURNER	TOOL STRING/SN MSI E-LOG 40GRP SN 5513
WITNESSED BY AARON - NATIONAL	LOG TIME:ON SITE/OFF SITE 1:00 P.M.
RUN BOREHOLE RECORD	
NO. BIT FROM TO	CASING RECORD
1 ? SURFACE 40 FT.	SIZE 14 IN. WGT. STEEL FROM TO
2 10 5/8 IN. 40 FT.	TOTAL DEPTH
3	
COMMENTS:	

Tool Summary:					
Date	3-9-17	Date	3-9-17	Date	3-9-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	MSI E-LOG 40GRP	Tool Model	MSI 60mm SONIC
Tool SN	4953	Tool SN	5513	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1202 FT.	To	1202 FT.	To	1202 FT.
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	A. OLSON
Truck No	310	Truck No	310	Truck No	310
Operation Check	3-7-17	Operation Check	3-7-17	Operation Check	3-7-17
Calibration Check	3-7-17	Calibration Check	3-7-17	Calibration Check	N/A
Time Logged	1:25 P.M.	Time Logged	2:20 P.M.	Time Logged	3:00 P.M.
Date	3-9-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model		Tool Model	
Tool SN	6002	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1202 FT.	To		To	
Recorded By	A. OLSON	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	3-7-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	4:00 P.M.	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: 15 IN.			Calibration Points: 8 IN. & 23 IN.		

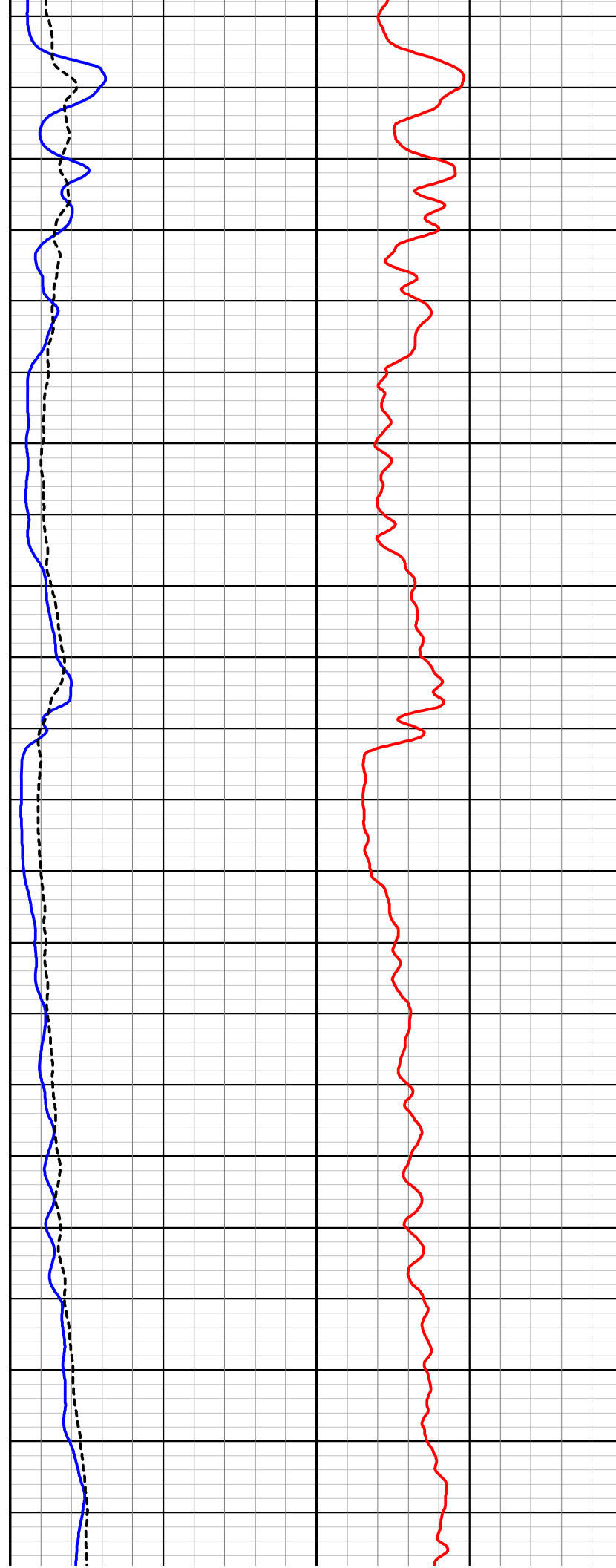
Disclaimer:

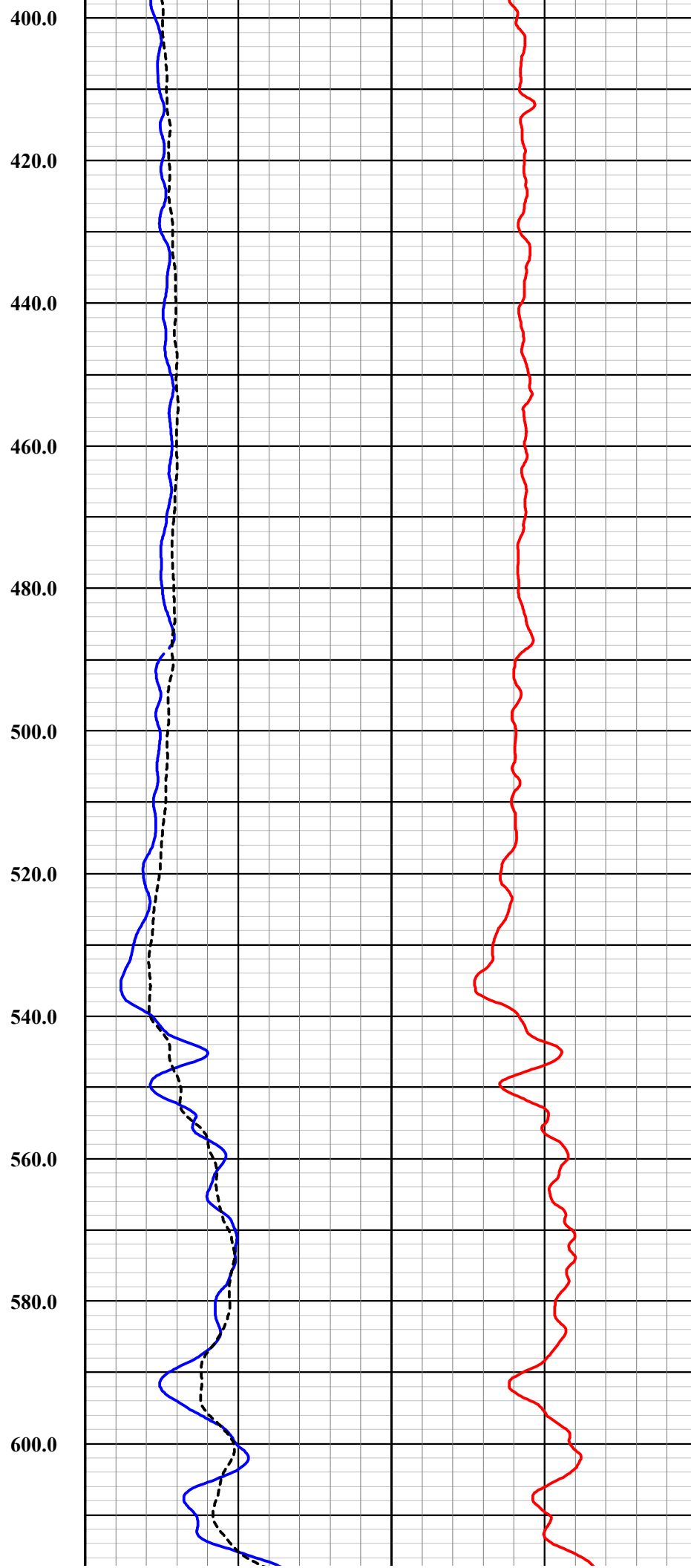
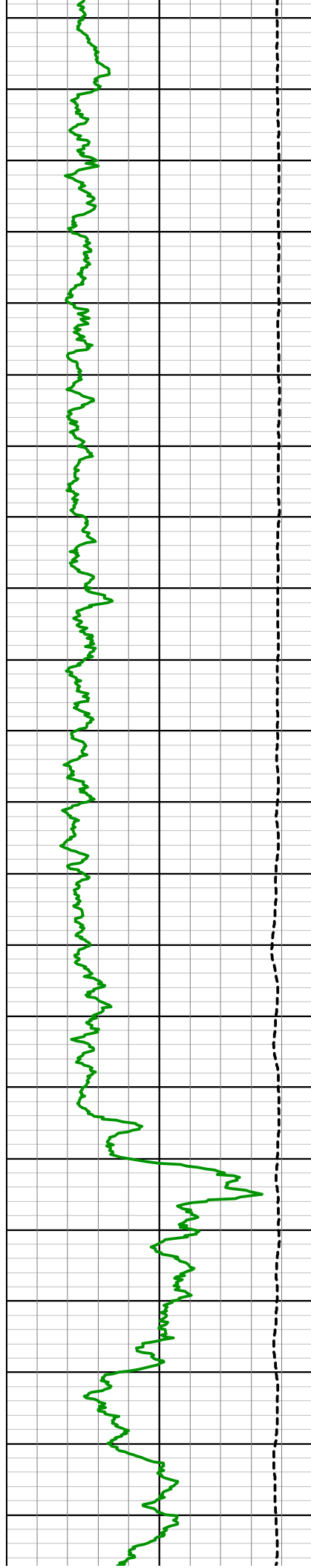
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

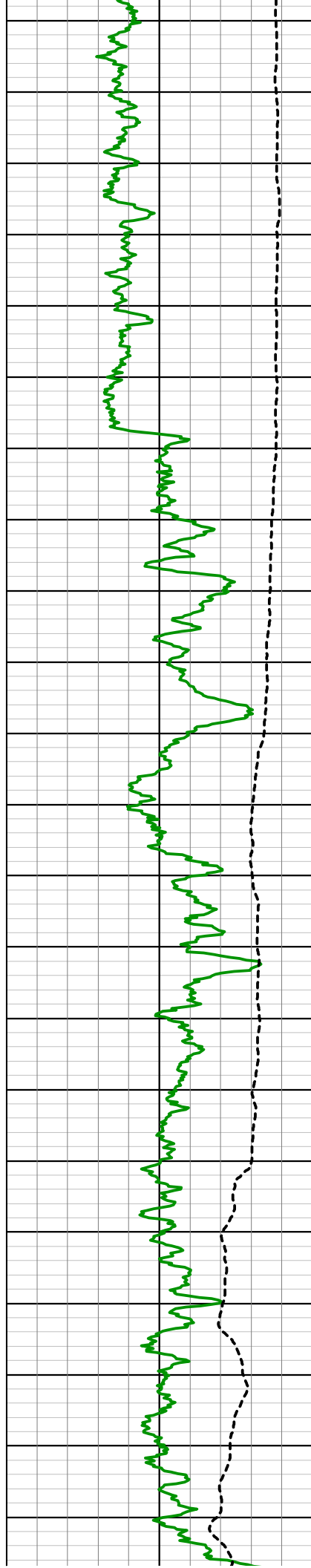




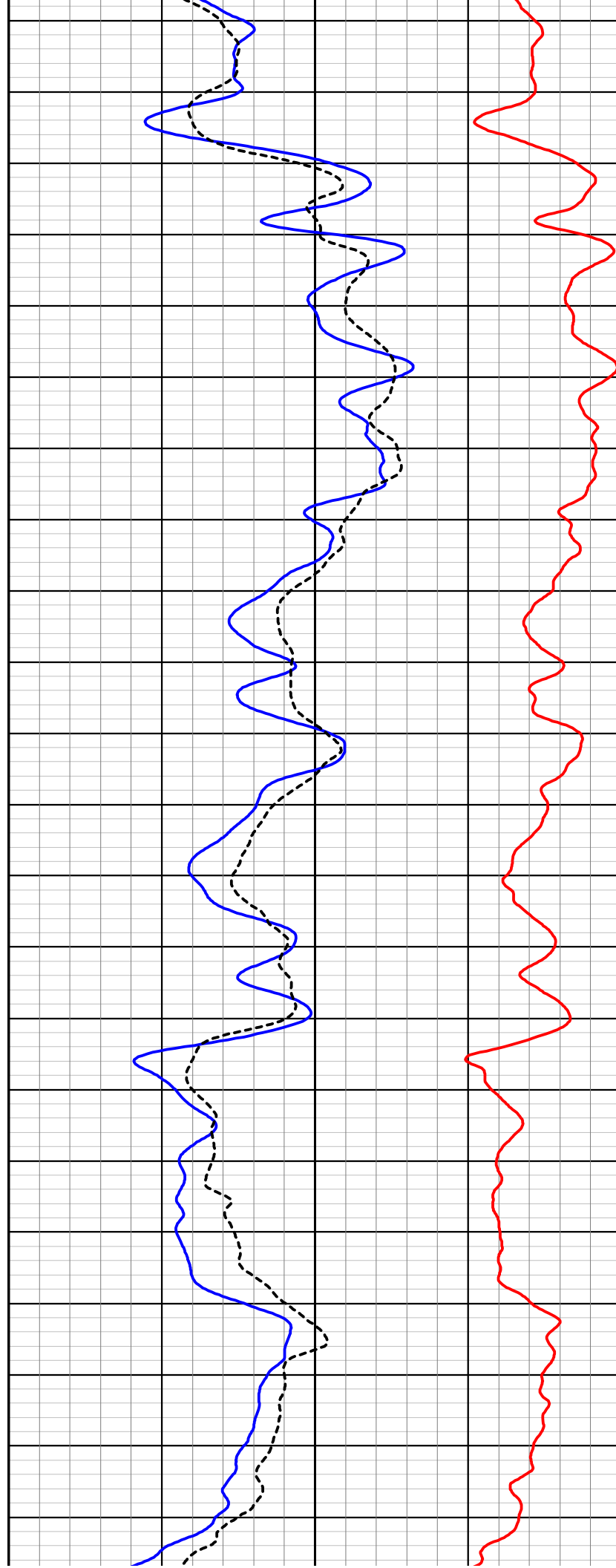
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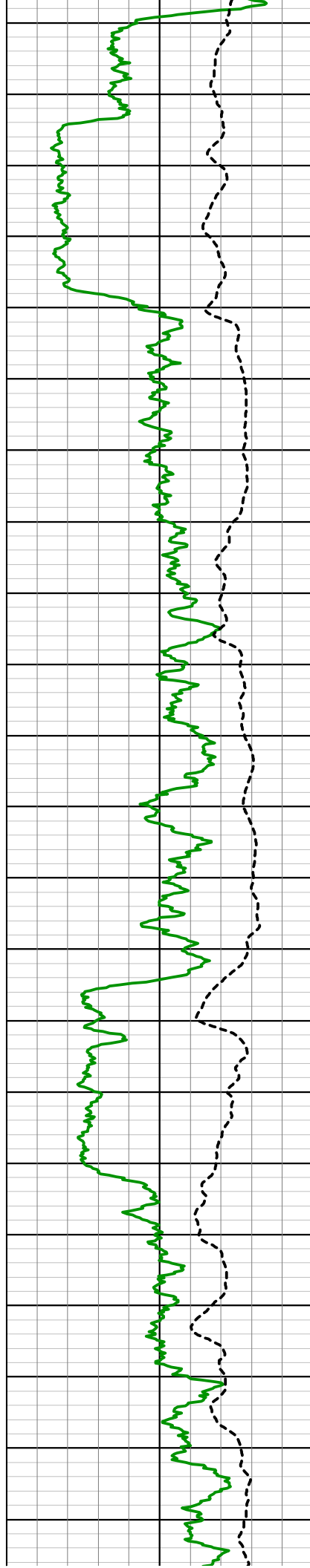




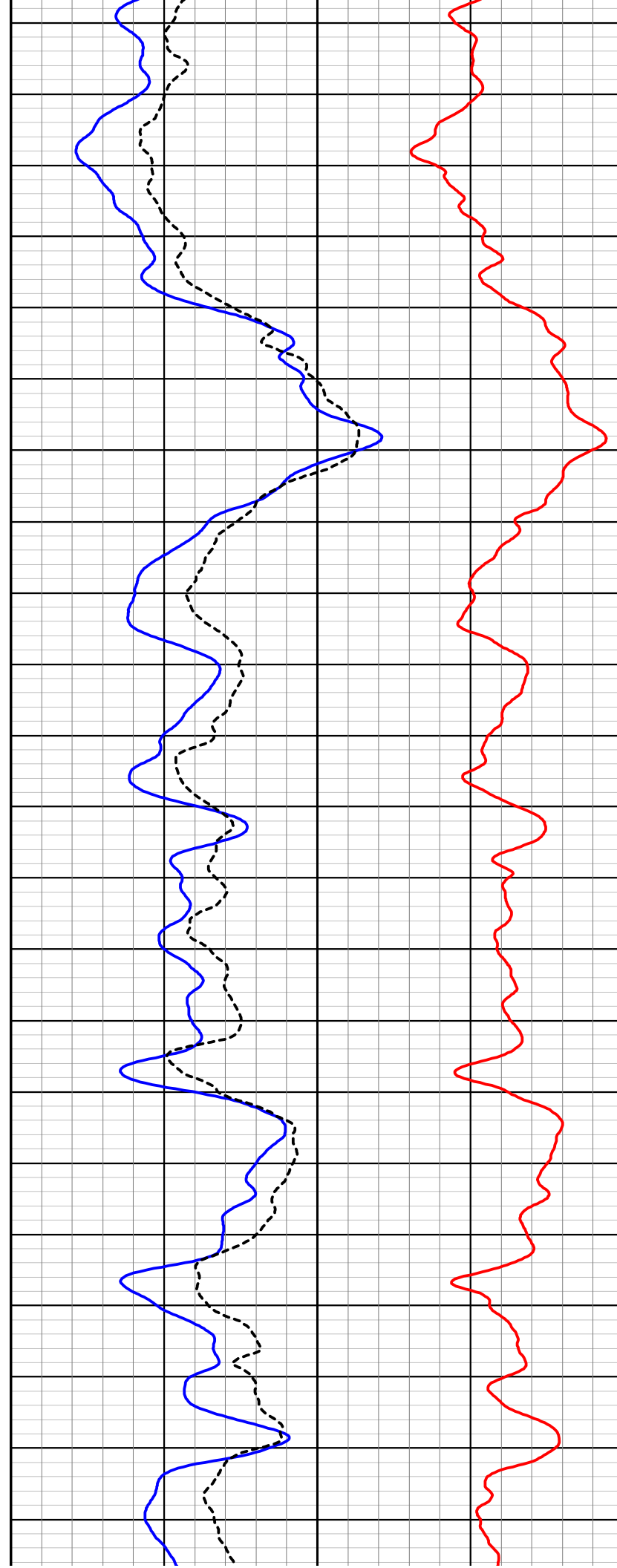


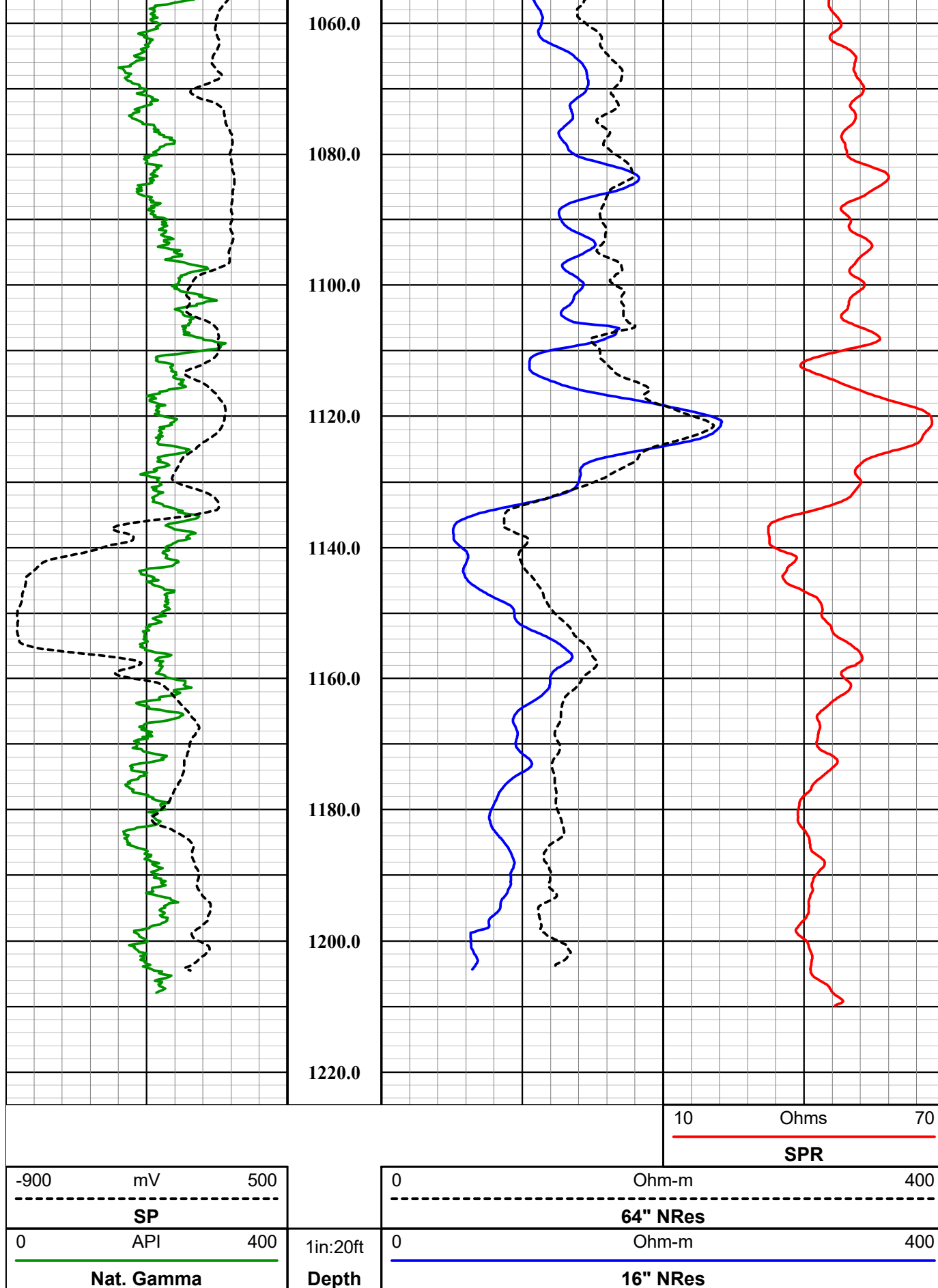
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900.0
920.0
940.0
960.0
980.0
1000.0
1020.0
1040.0





MSI 40 GRP E-Log Tool

Probe Top = Depth Ref.

Tool SN: 5019, 5513, & 5514

Four Conductor MSI Probe Top

Bridle connects to wireline cablehead: Wireline armor is the B Electrode.

Bridle Electrode (N Electrode)

Probe Length = 1.98 m or 6.5 ft

Bridle Length = 7.88 m or 25.86 ft

Probe Weight = 7.3 kg or 16.0 lbs

Can only be collected in fluid

Isolation Bridle

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

64" Normal Resistivity Electrode/Spontaneous Potential Electrode (M Electrode)

Electrode Measuring Points (from bottom of probe)

Spontaneous Potential (SP): 1.777 m or 5.81 ft

16" Normal Resistivity (16" NRes): 0.3548 m or 1.16 ft

64" Normal Resistivity (64" NRes): 0.9644 m or 3.16 ft

Single Point Resistance (SPR): 0.152 m or 0.50 ft

Natural Gamma Ray (Nat. Gamma): 0.73 m or 2.39 ft

Natural Gamma Ray

16" Normal Resistivity Electrode (M Electrode)

Current Electrode/Single Point Resistance Electrode (A Electrode)

1.63" or 40 mm Diameter (41.4 mm with neoprene heat shrink and electrical tape)



**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Well
Field
County
State

M57-0
FLORENCE COPPER
PINAL
ARIZONA

Final

E-Log Summary



Southwest Exploration Services, LLC

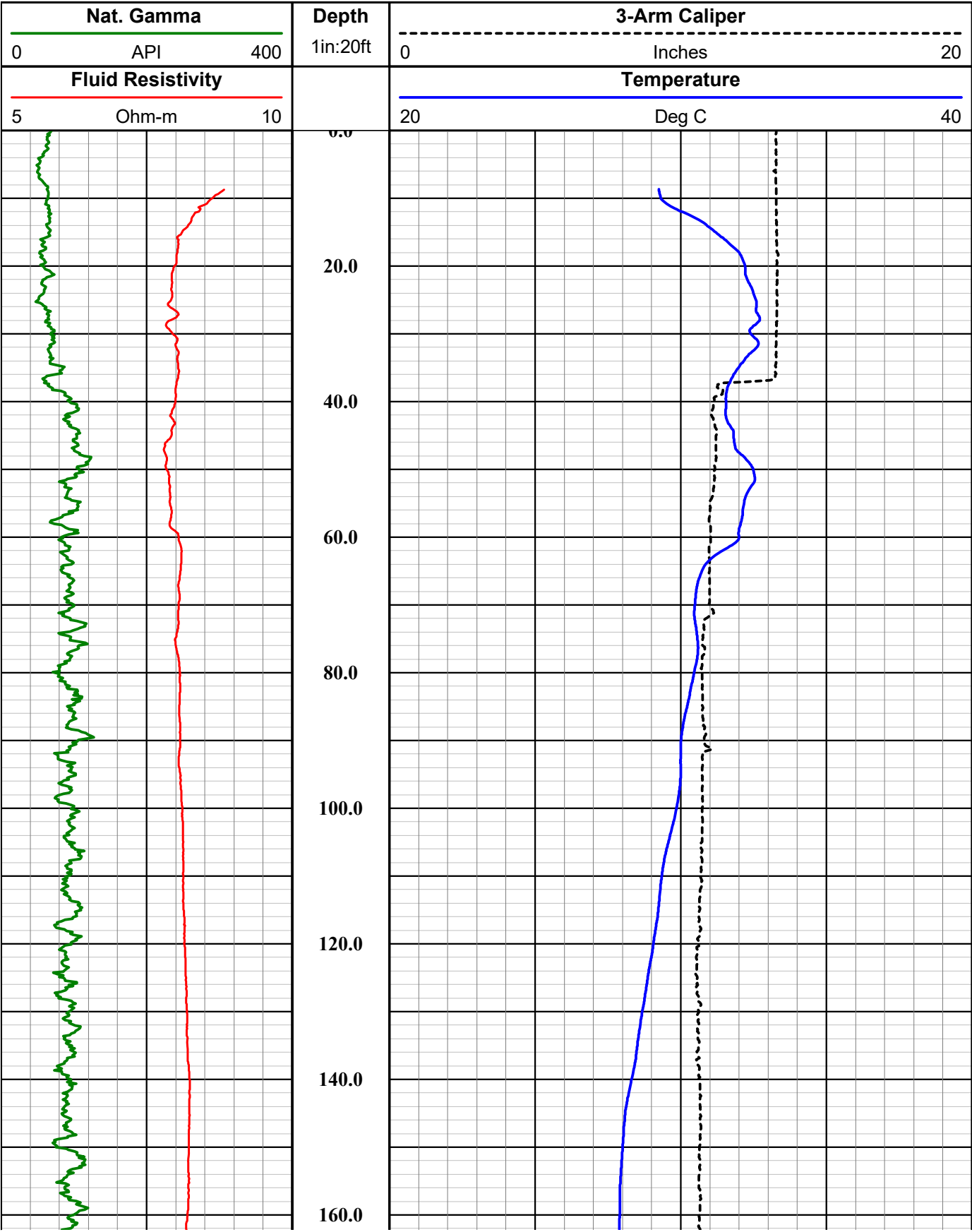
borehole geophysics & video services

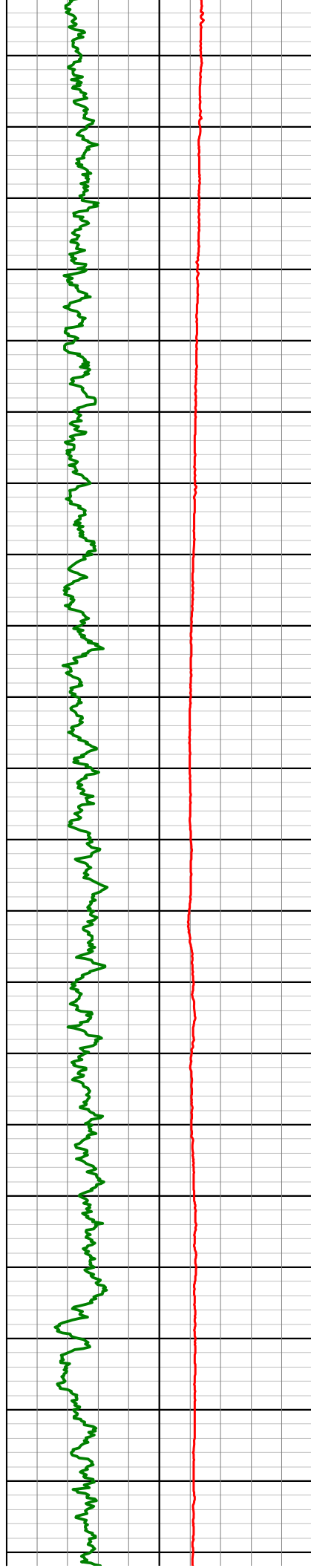
COMPANY FLORENCE COPPER				
WELL ID M57-0		FIELD FLORENCE COPPER		
COUNTY PINAL	STATE ARIZONA			
TYPE OF LOGS: GAMMA - CALIPER MORE: TEMP - FLUID RES.		OTHER SERVICES E-LOGS SONIC DEVIATION		
LOCATION				
SEC	TWP	RGE		
PERMANENT DATUM		ELEVATION		K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM		D.F.
DRILLING MEAS. FROM	GROUND LEVEL			G.L.
DATE	3-9-17	TYPE FLUID IN HOLE	MUD	
RUN No	1	MUD WEIGHT	N/A	
TYPE LOG	GAMMA-CALIPER-TFR	VISCOSITY	N/A	
DEPTH-DRILLER	1210 FT.	LEVEL	FULL	
DEPTH-LOGGER	1202 FT.	MAX. REC. TEMP.	32.72 DEG. C	
BTM LOGGED INTERVAL	1202 FT.	IMAGE ORIENTED TO:	N/A	
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT	
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310	
RECORDED BY / Logging Eng.	A. OLSON / E. TURNER	TOOL STRING/SN	MSI COMBO TOOL SN 4953	
WITNESSED BY	AARON - NATIONAL	LOG TIME:ON SITE/OFF SITE	1:00 P.M.	
BOREHOLE RECORD		CASING RECORD		
NO.	BIT FROM TO	SIZE	WGT.	FROM TO
1	? SURFACE 40 FT.	14 IN.	STEEL	SURFACE 40 FT.
2	10 5/8 IN. 40 FT.	TOTAL DEPTH		
3				
COMMENTS:				

Tool Summary:					
Date	3-9-17	Date	3-9-17	Date	3-9-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	MSI E-LOG 40GRP	Tool Model	MSI 60mm SONIC
Tool SN	4953	Tool SN	5513	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1202 FT.	To	1202 FT.	To	1202 FT.
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	A. OLSON
Truck No	310	Truck No	310	Truck No	310
Operation Check	3-7-17	Operation Check	3-7-17	Operation Check	3-7-17
Calibration Check	3-7-17	Calibration Check	3-7-17	Calibration Check	N/A
Time Logged	1:25 P.M.	Time Logged	2:20 P.M.	Time Logged	3:00 P.M.
Date	3-9-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model		Tool Model	
Tool SN	6002	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1202 FT.	To		To	
Recorded By	A. OLSON	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	3-7-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	4:00 P.M.	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: 15 IN.			Calibration Points: 8 IN. & 23 IN.		

Disclaimer:

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.





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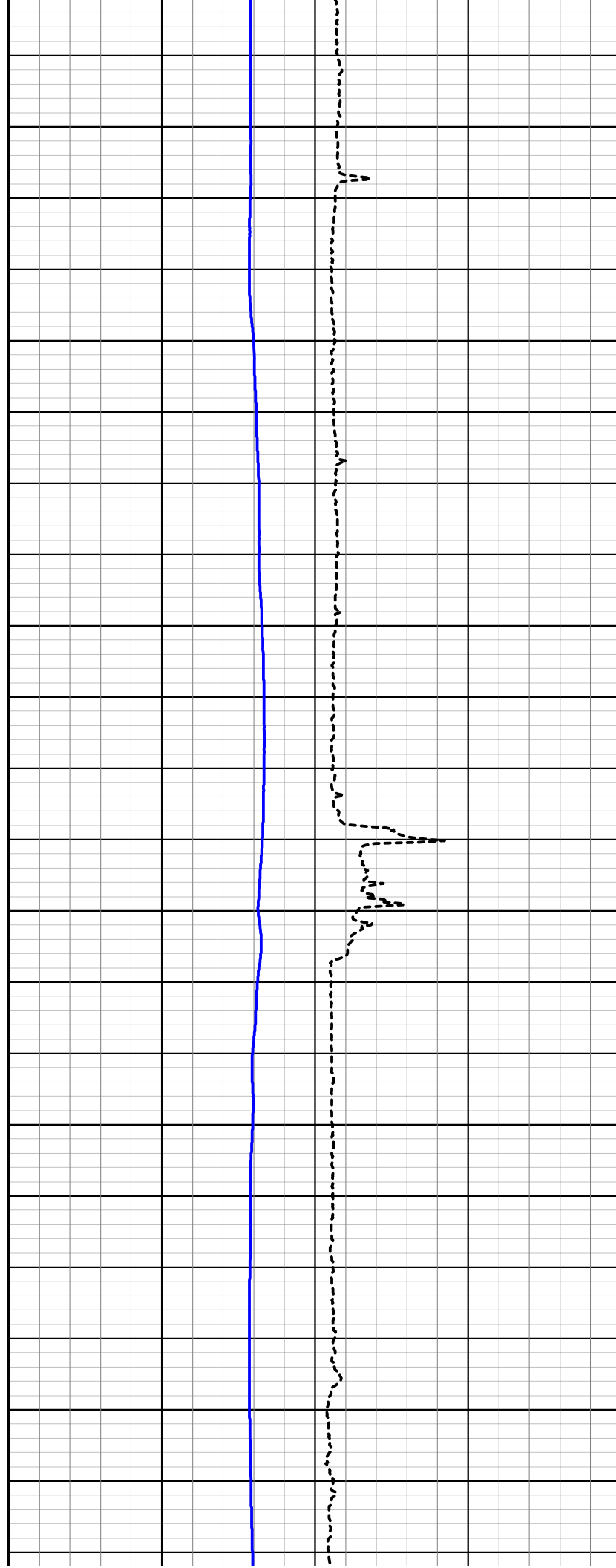
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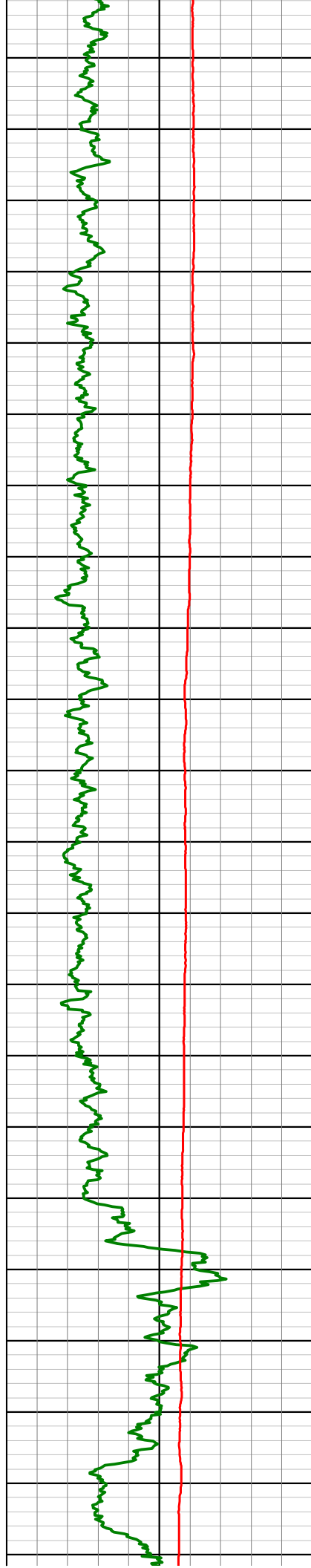
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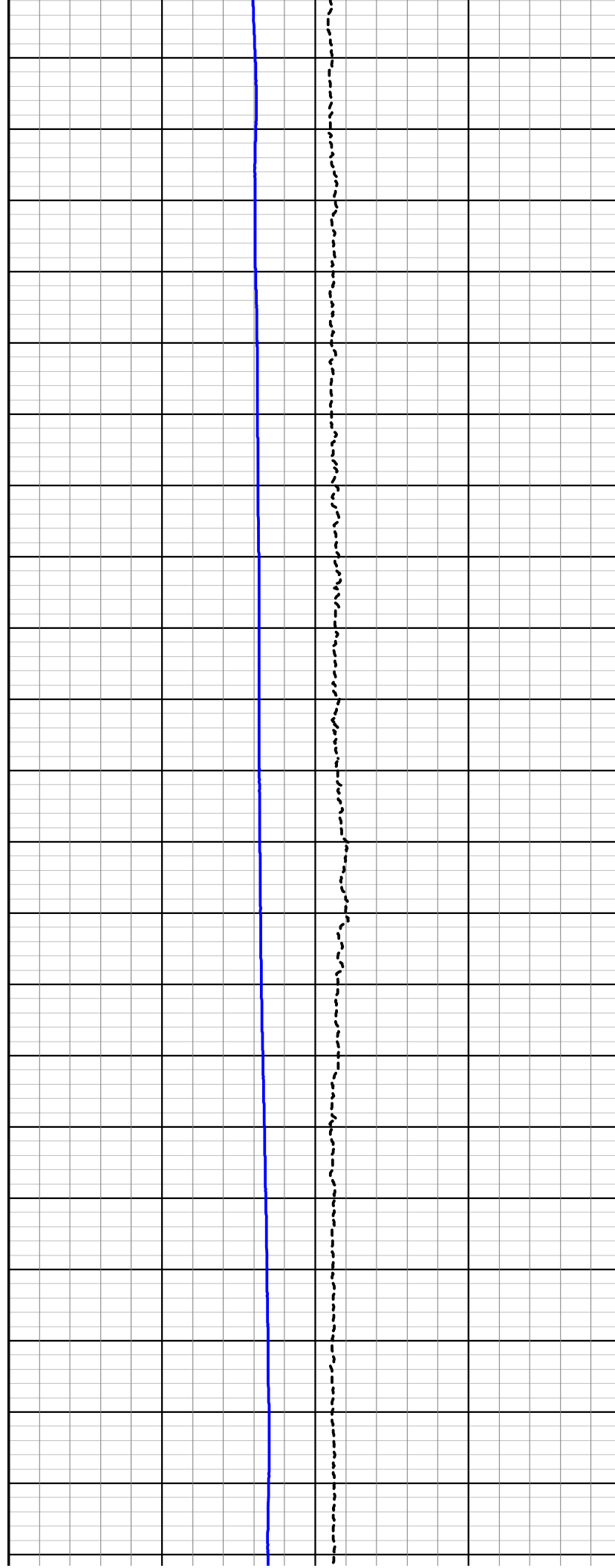
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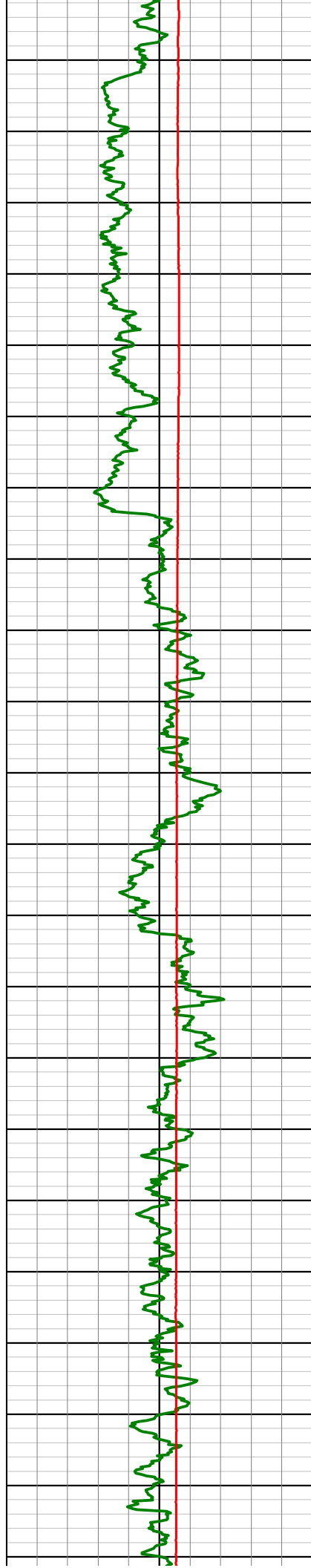
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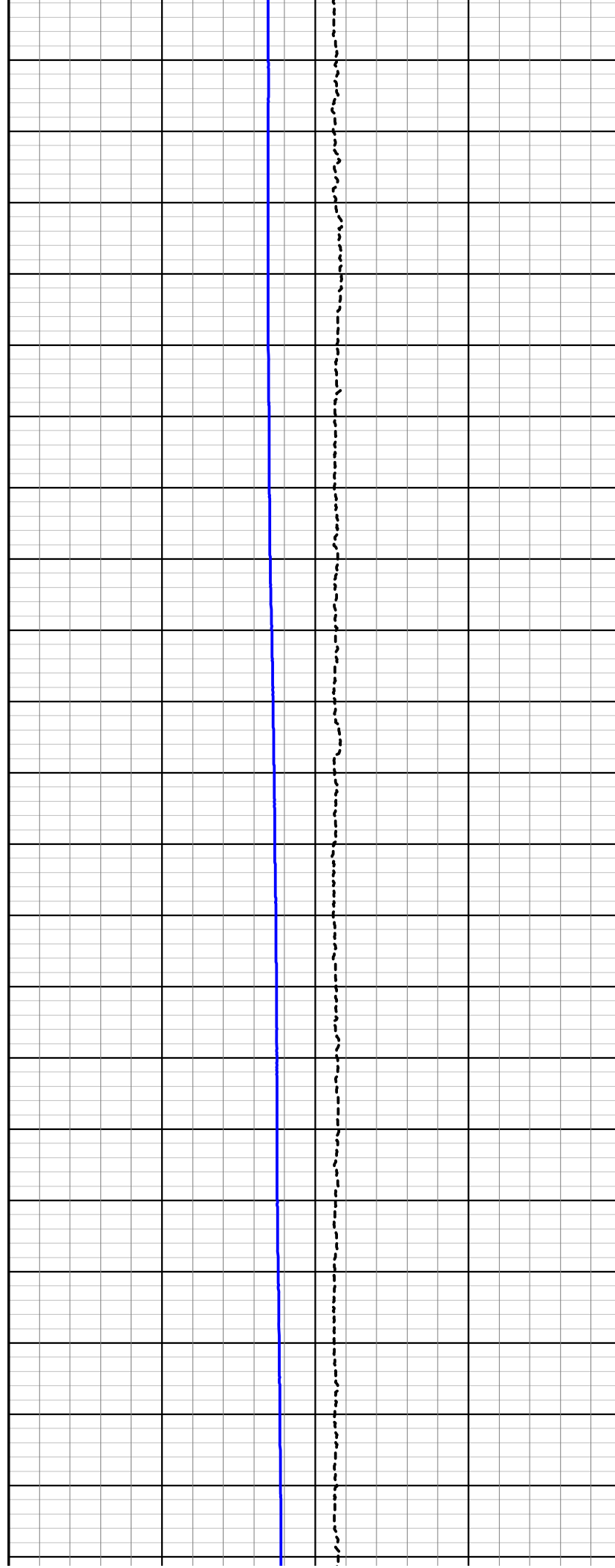
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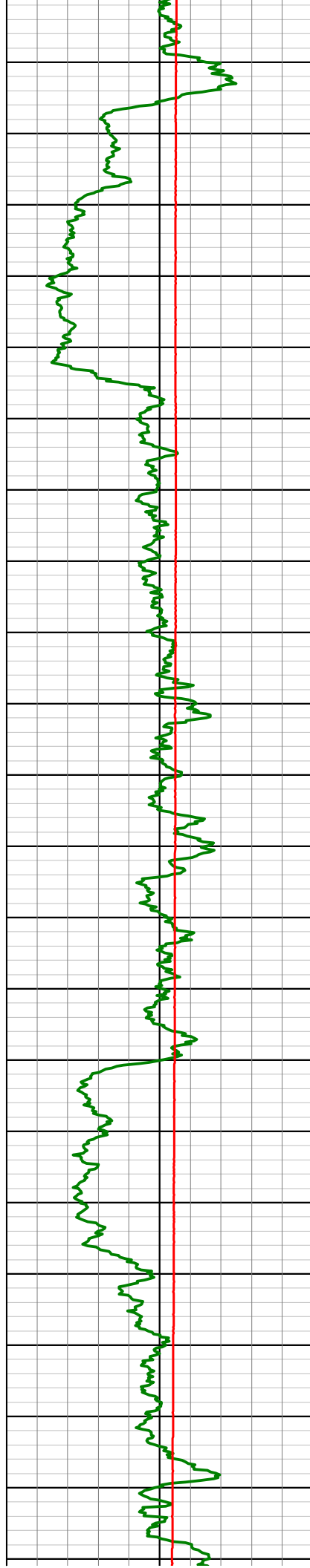
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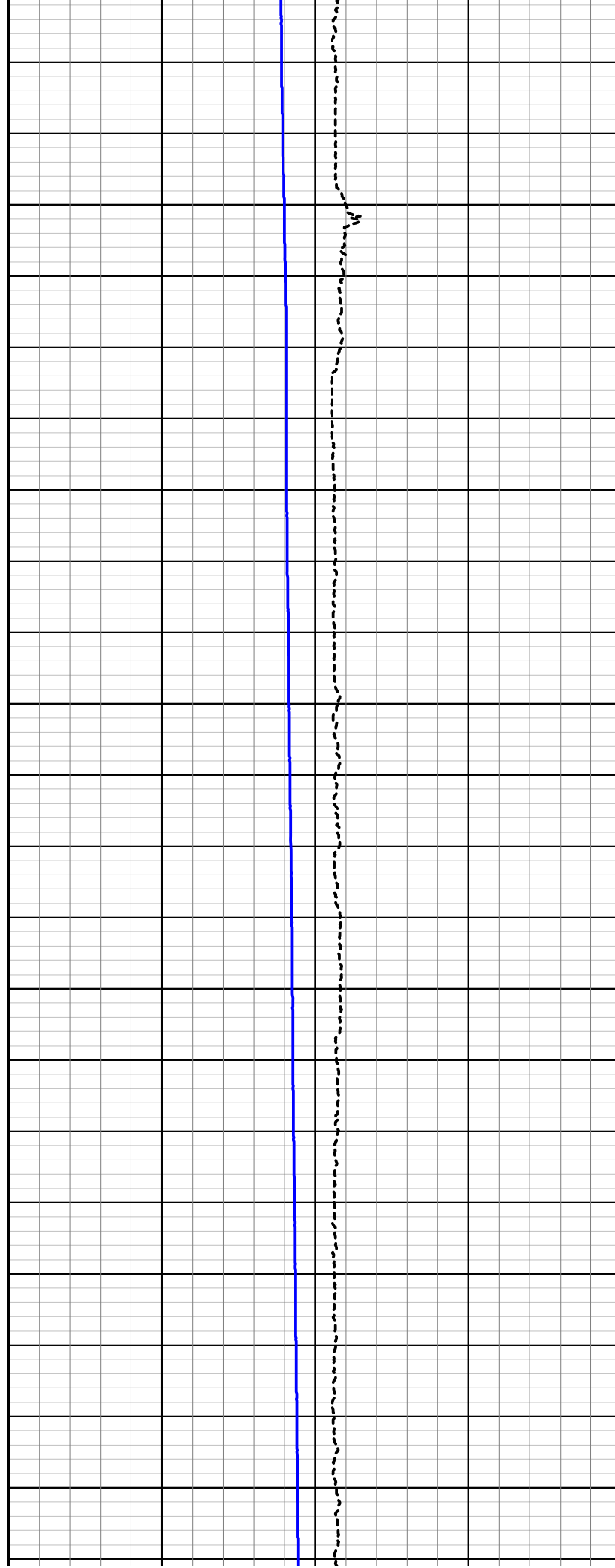
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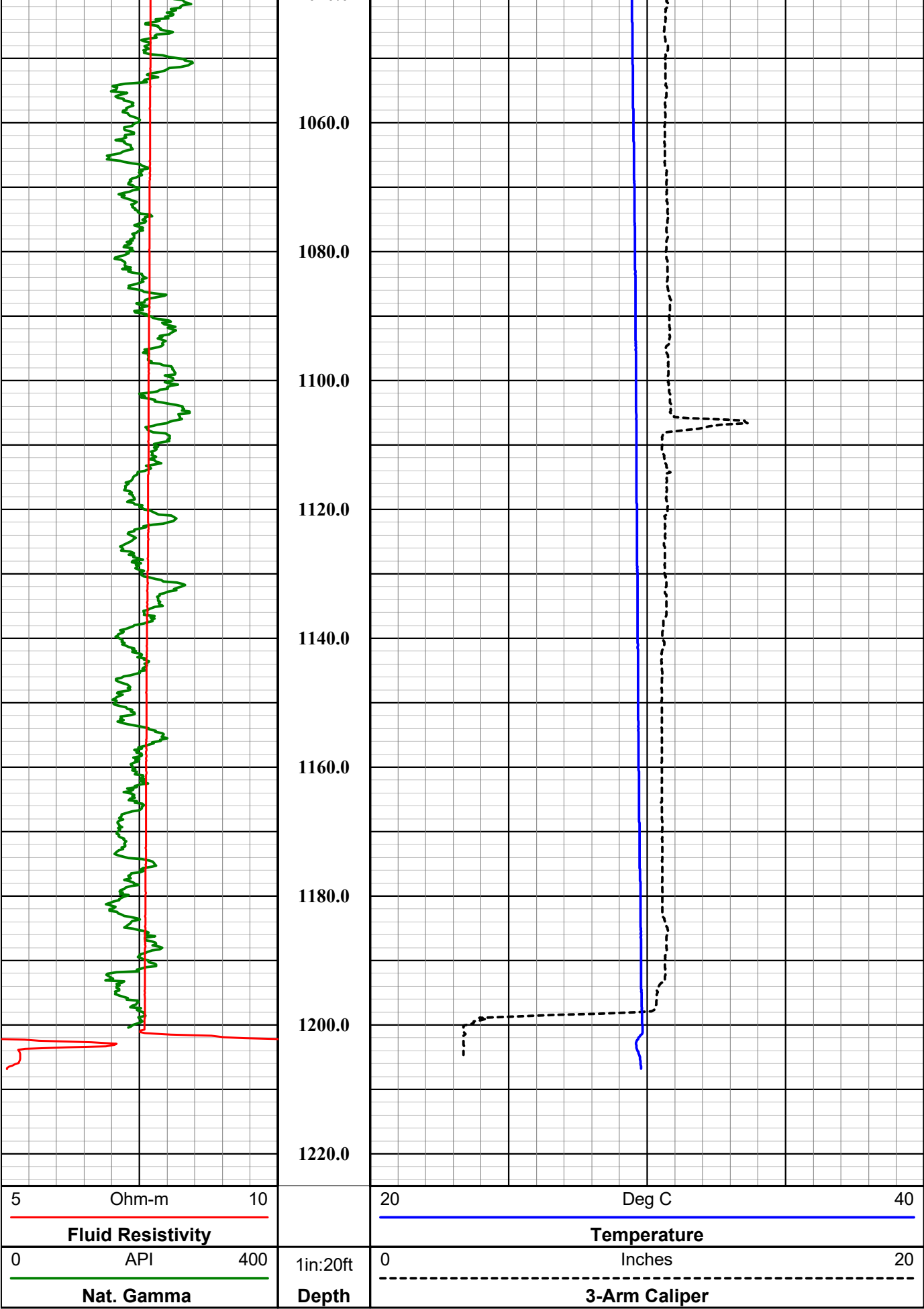
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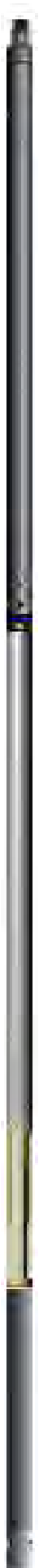
1020.0

1040.0





Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company

FLORENCE COPPER

Well

M57-0

Field

FLORENCE COPPER

County

PINAL

State

ARIZONA

Final

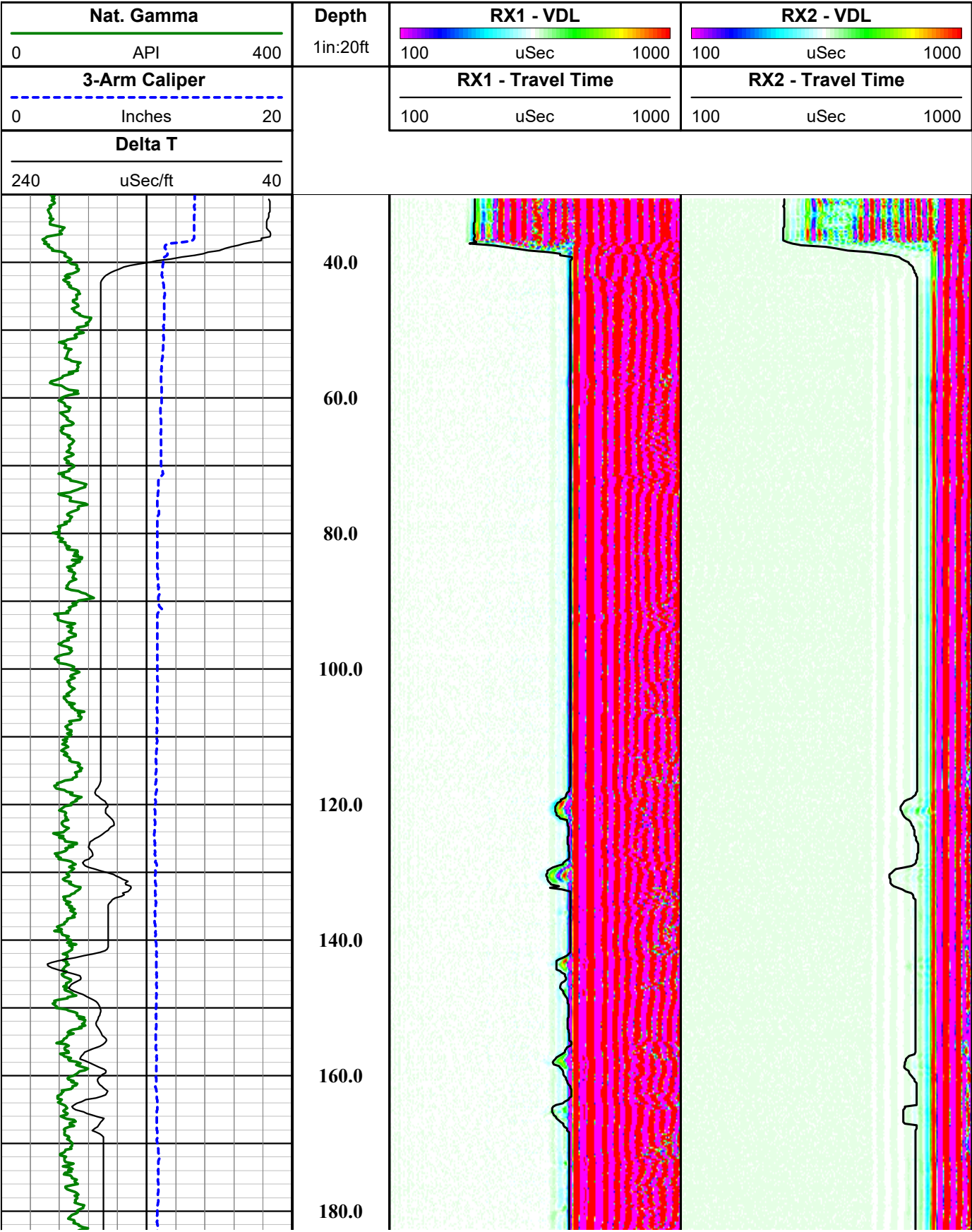
GCT Summary

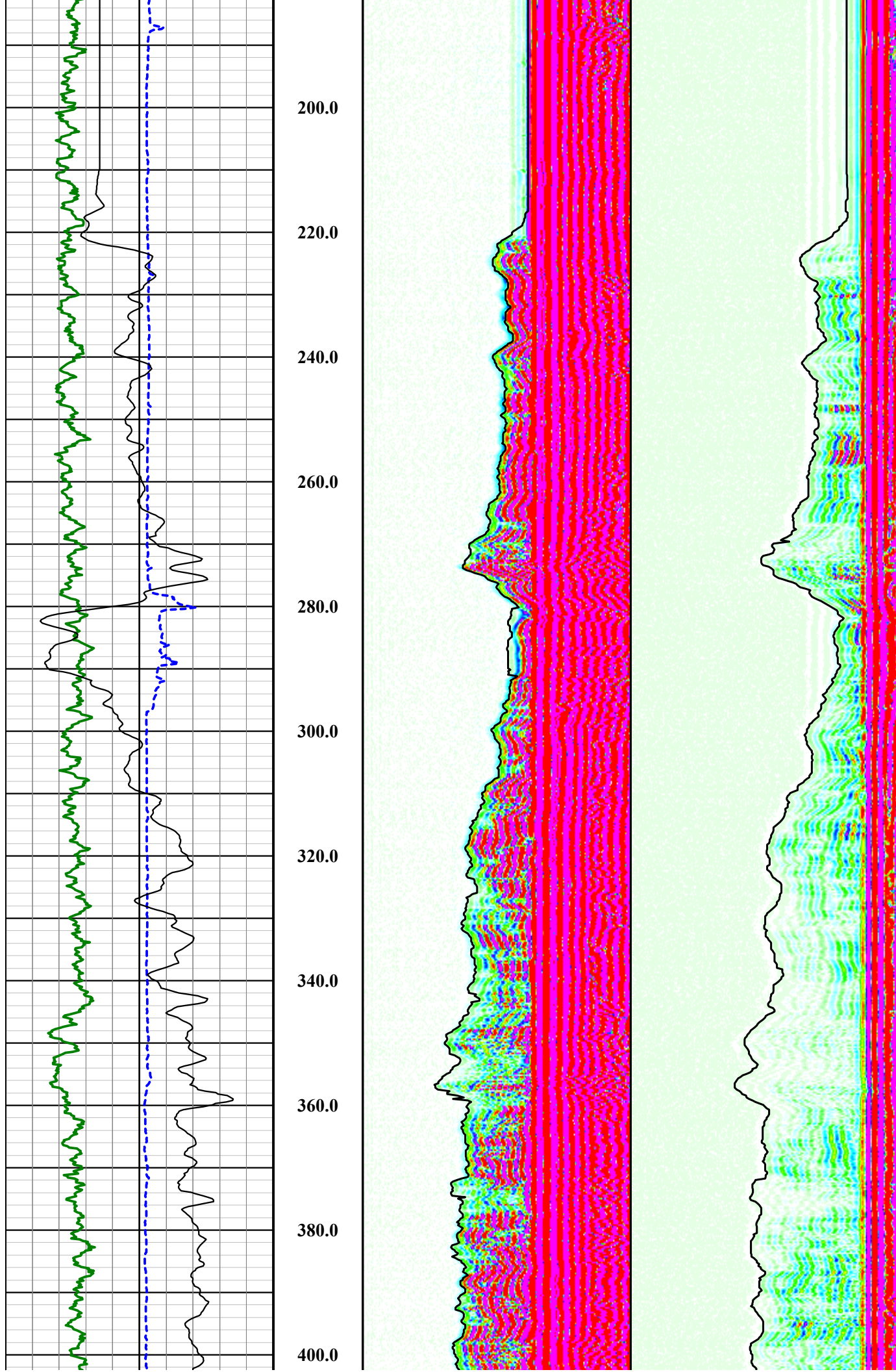


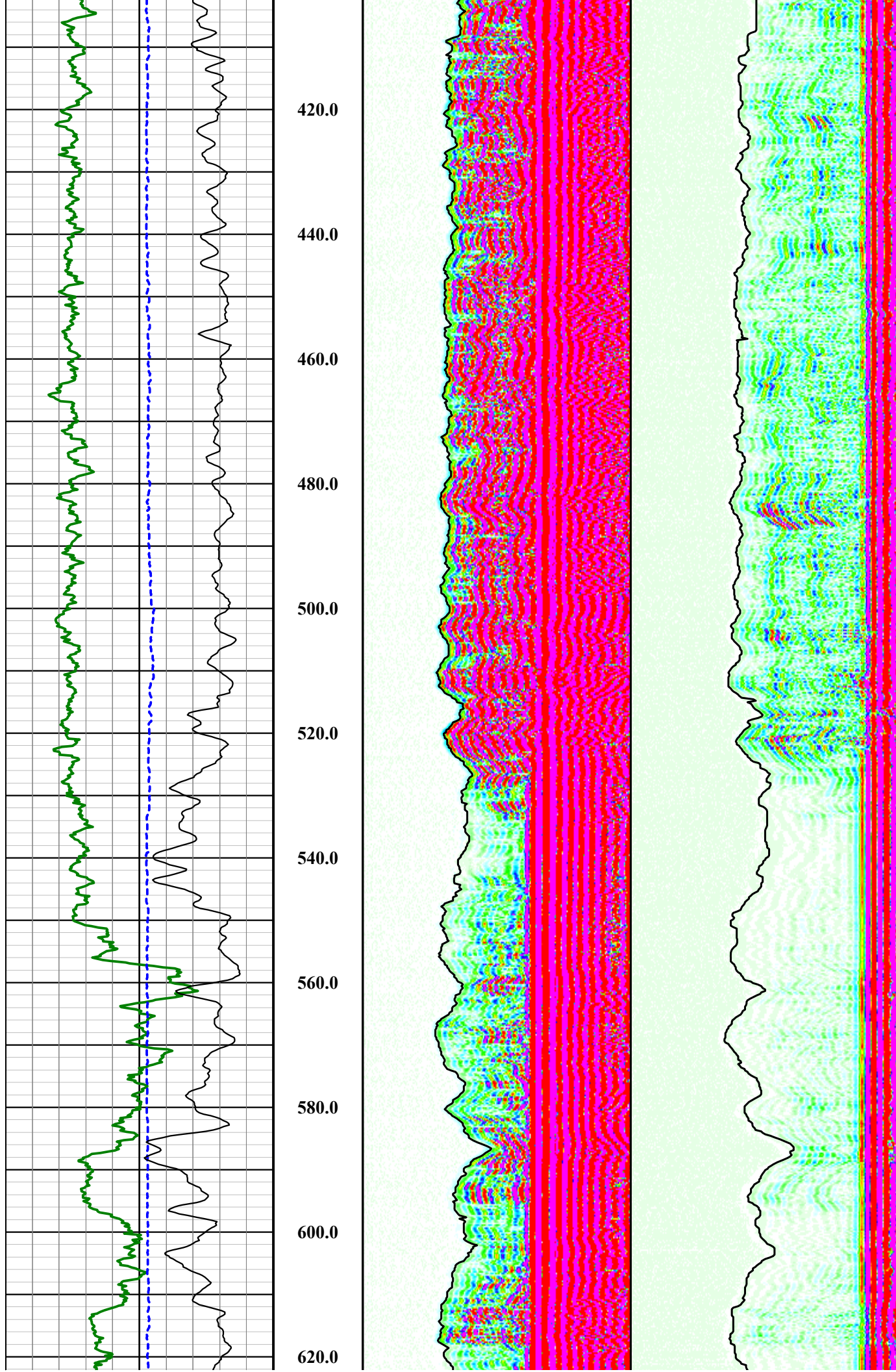
Tool Summary:					
Date	3-9-17	Date	3-9-17	Date	3-9-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	MSI E-LOG 40GRP	Tool Model	MSI 60mm SONIC
Tool SN	4953	Tool SN	5513	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1202 FT.	To	1202 FT.	To	1202 FT.
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	A. OLSON
Truck No	310	Truck No	310	Truck No	310
Operation Check	3-7-17	Operation Check	3-7-17	Operation Check	3-7-17
Calibration Check	3-7-17	Calibration Check	3-7-17	Calibration Check	N/A
Time Logged	1:25 P.M.	Time Logged	2:20 P.M.	Time Logged	3:00 P.M.
Date	3-9-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model		Tool Model	
Tool SN	6002	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1202 FT.	To		To	
Recorded By	A. OLSON	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	3-7-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	4:00 P.M.	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: 15 IN.		Calibration Points: 8 IN. & 23 IN.			

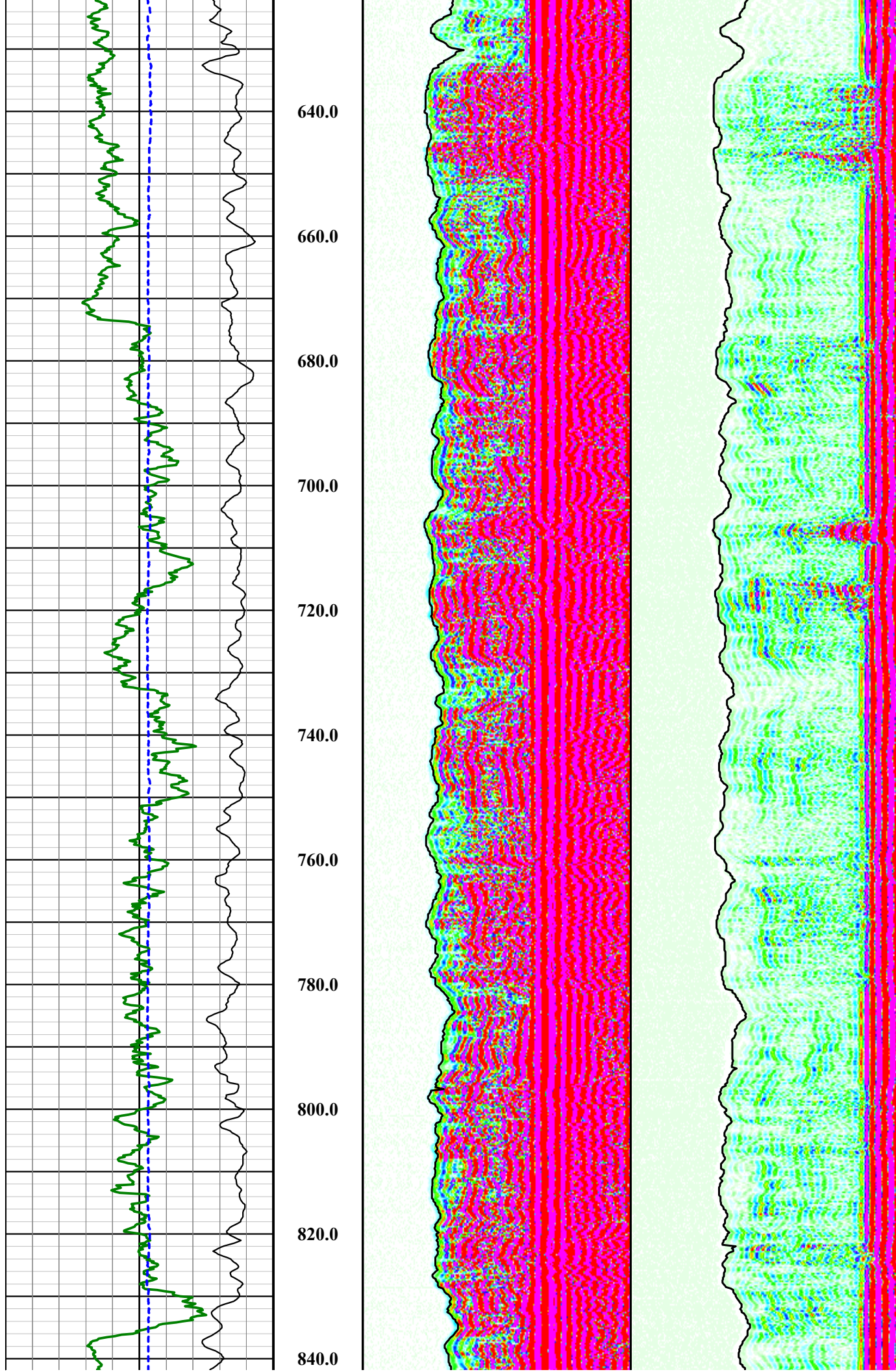
Disclaimer:

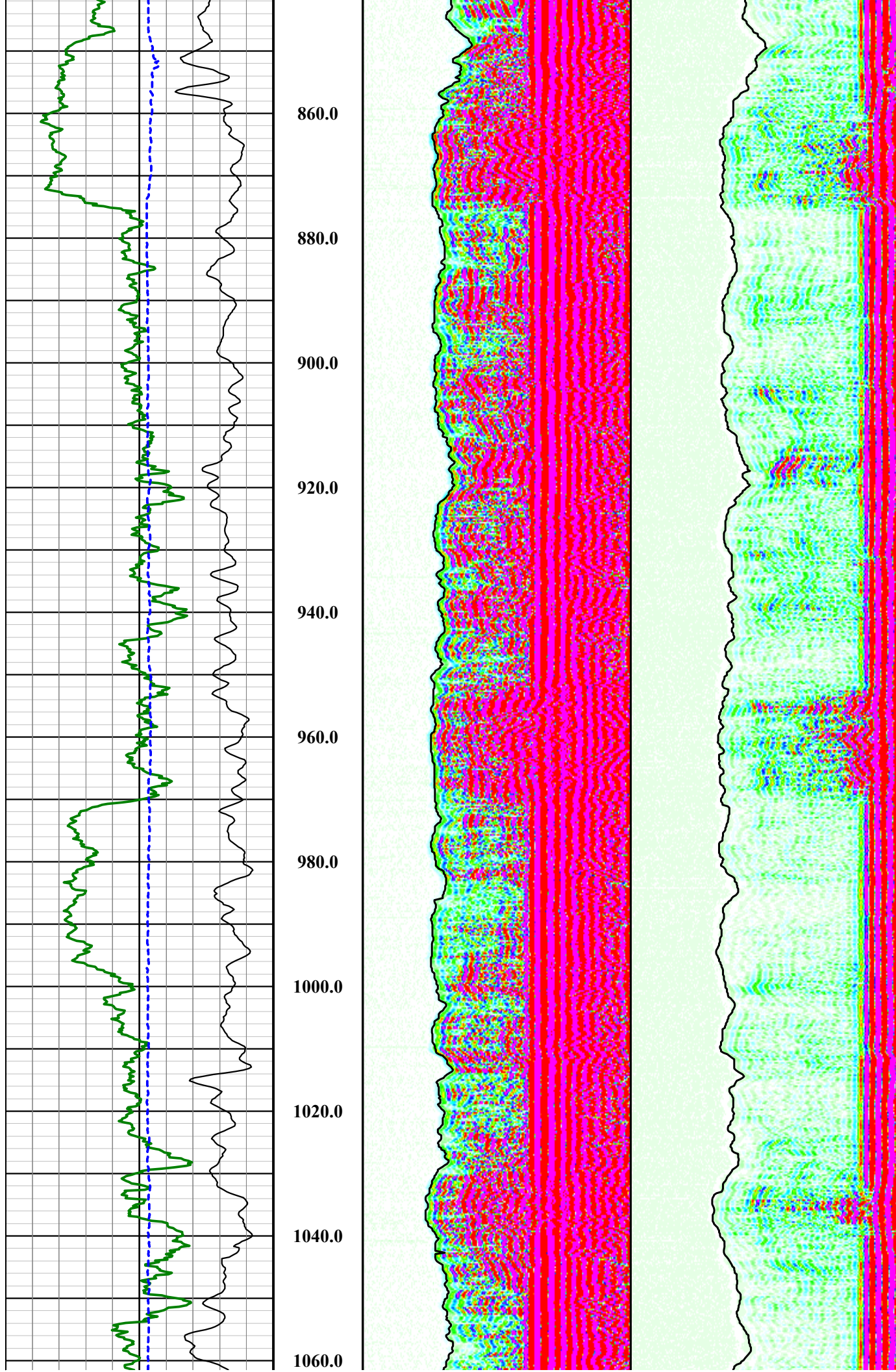
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

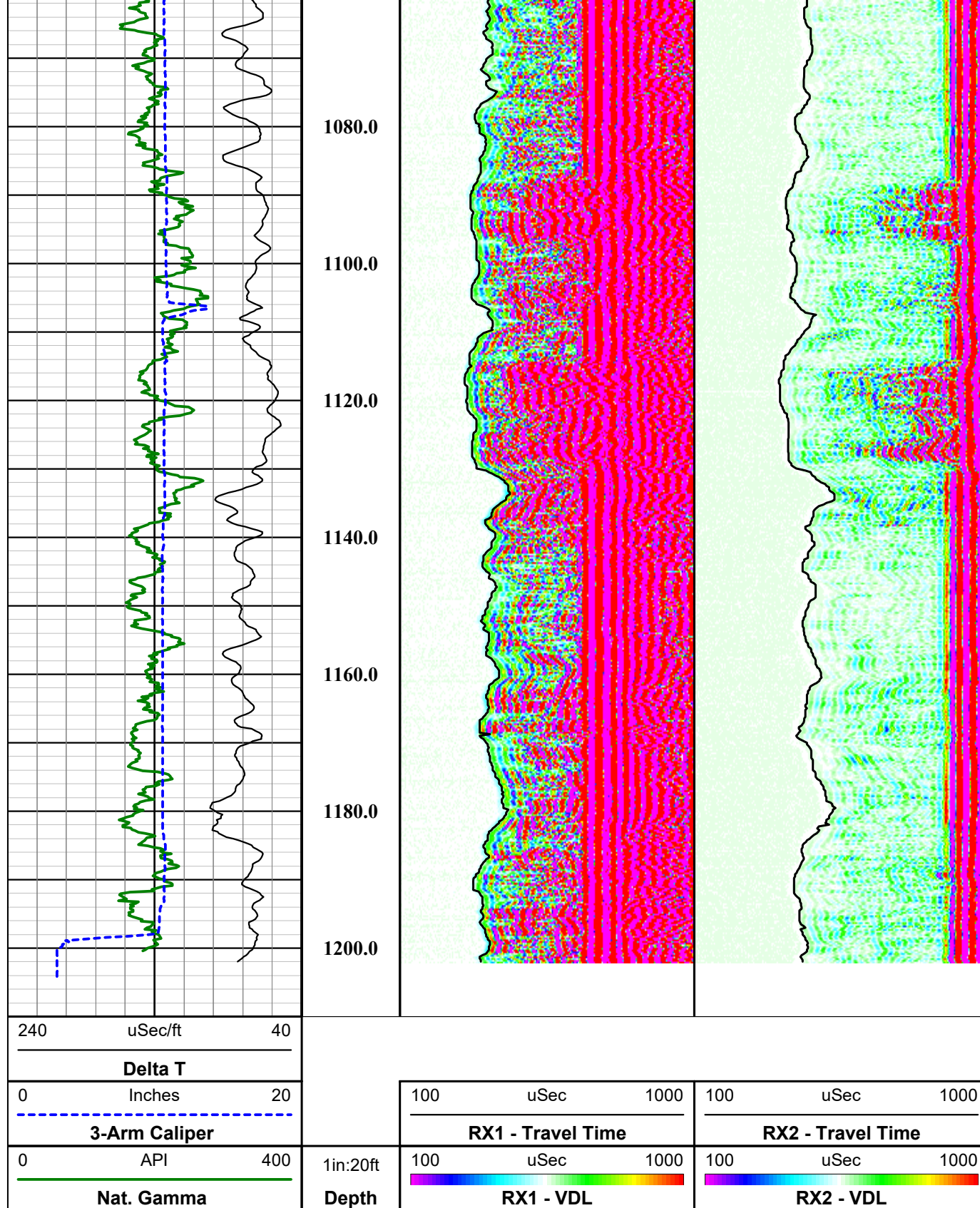












MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

Tool SN: 6001 & 6002



Four Conductor MSI Probe Top



Probe Length = 2.8 m or 9.19 ft
Probe Weight = ~26.5 kg or 58.4 lbs

Sensors: Ceramic Piezoelectric

Transmitter Frequency: 24 - 28 kHz resonant frequency

Rx - Rx Spacing: 0.3 m (12.0 in)

Typically centralized with external centralizers

Can only be collected in fluid

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

—— Rx-2 Tx - Rx2 Spacing = 1.22 m (48.0 in)

—— Rx-1 Tx - Rx1 Spacing = .91 m (36.0 in)

—— Acoustic Isolater

—— Tx = Acoustic Transmitter

0.660 m or 26.0 in. - End of tool to center of Tx

2.36 in or 60 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity SN 4953

Probe Top = Depth Ref.



—— Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Pressure Rating: 200 bar (2900 psi)

———— Natural Gamma Ray = 0.76 m (29.75 in)

———— 3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

———— TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter





Services, LLC

borehole geophysics & video services

Field
County
State

FLORENCE COPPER
PINAL
ARIZONA

Final

Sonic Summary



Southwest Exploration Services, LLC

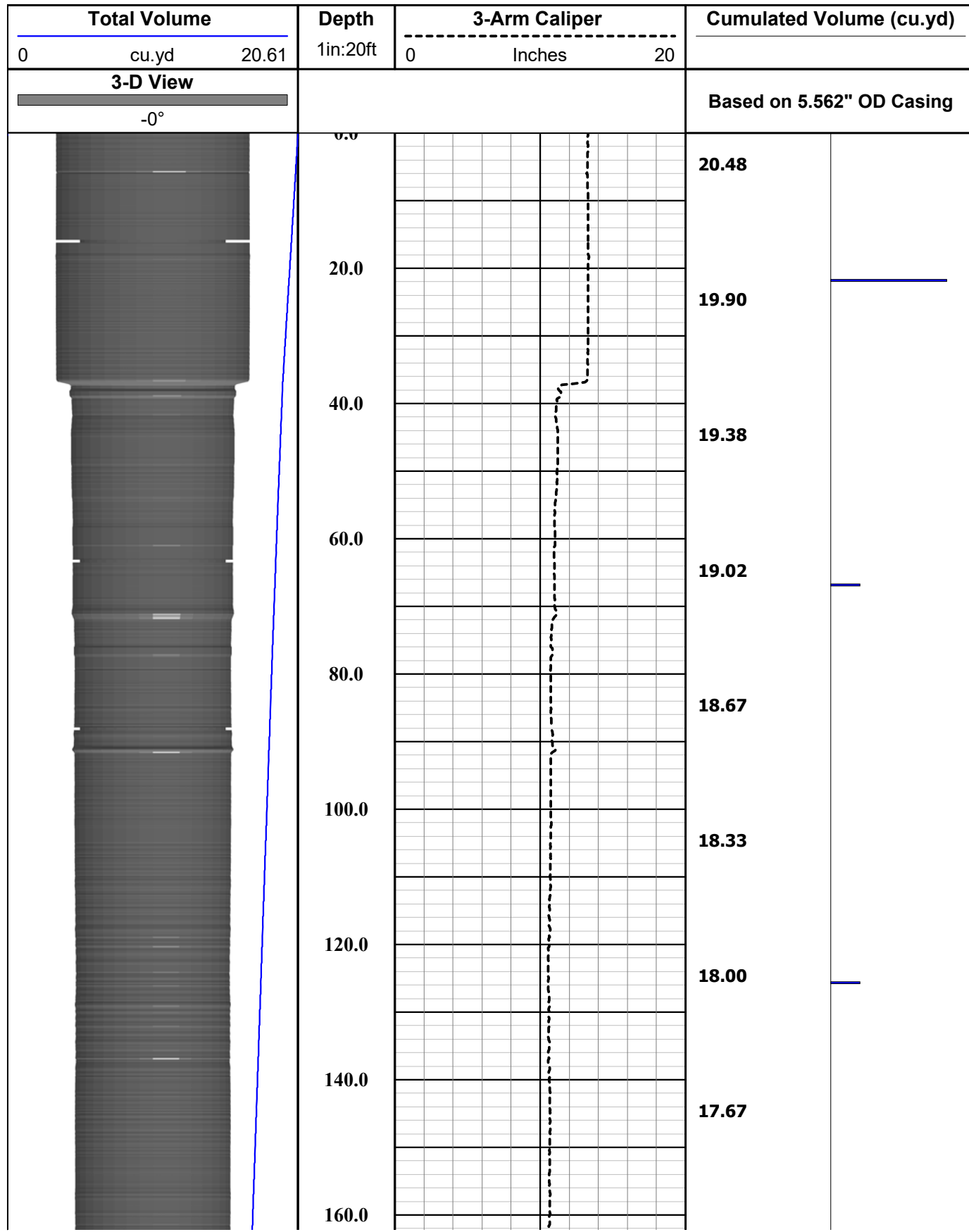
borehole geophysics & video services

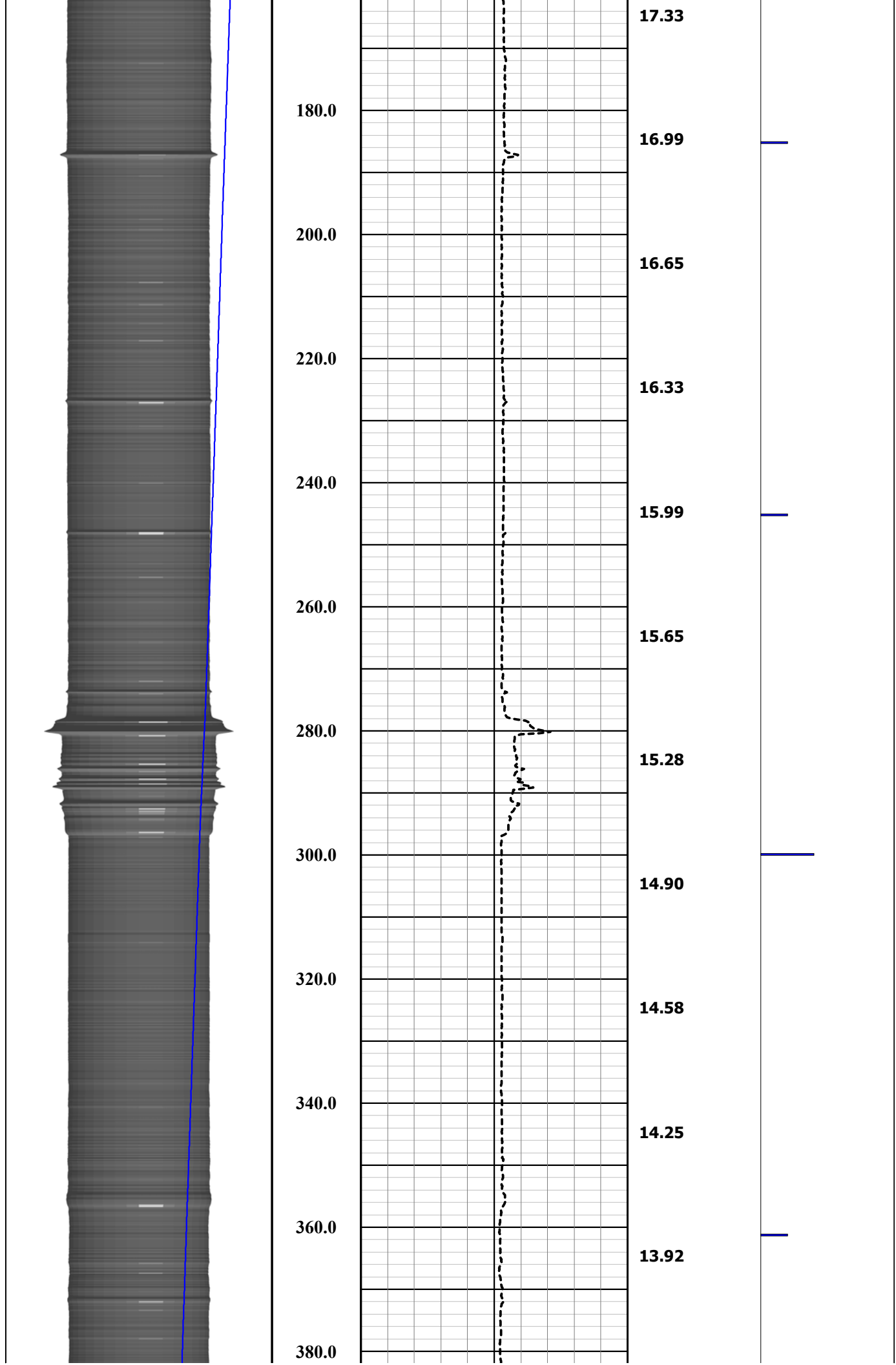
COMPANY FLORENCE COPPER		WELL ID M57-0		FIELD FLORENCE COPPER		COUNTY PINAL		STATE ARIZONA	
TYPE OF LOGS: 3-ARM CALIPER		MORE: W/ VOLUME CALC.		LOCATION		SEC		TWP	
PERMANENT DATUM		GROUND LEVEL		ELEVATION		LOG MEAS. FROM		GROUND LEVEL	
DRILLING MEAS. FROM		GROUND LEVEL		DATE		3-9-17		TYPE FLUID IN HOLE	
RUN No		1		MUD WEIGHT		N/A		K.B.	
TYPE LOG		3-ARM CALIPER		VISCOSITY		N/A		D.F.	
DEPTH-DRILLER		1210 FT.		LEVEL		FULL		G.L.	
DEPTH-LOGGER		1202 FT.		MAX. REC. TEMP.		32.72 DEG. C		MUD	
BTM LOGGED INTERVAL		1202 FT.		IMAGE ORIENTED TO:		N/A		LOG TIME:ON SITE/OFF SITE	
TOP LOGGED INTERVAL		SURFACE		SAMPLE INTERVAL		0.2 FT		MSI COMBO TOOL SN 4953	
DRILLER / RIG#		NATIONAL DRILLING		LOGGING TRUCK		TRUCK #310		1:00 P.M.	
RECORDED BY / Logging Eng.		A. OLSON / E. TURNER		TOOL STRING/SN		MSI COMBO TOOL SN 4953			
WITNESSED BY		AARON - NATIONAL		LOG TIME:ON SITE/OFF SITE					
RUN		BOREHOLE RECORD		CASING RECORD					
NO.		BIT FROM		TO SIZE		WGT. FROM		TO	
1		SURFACE		40 FT. 14 IN.		STEEL SURFACE		40 FT.	
2		10 5/8 IN.		40 FT.		TOTAL DEPTH			
3									
COMMENTS:									

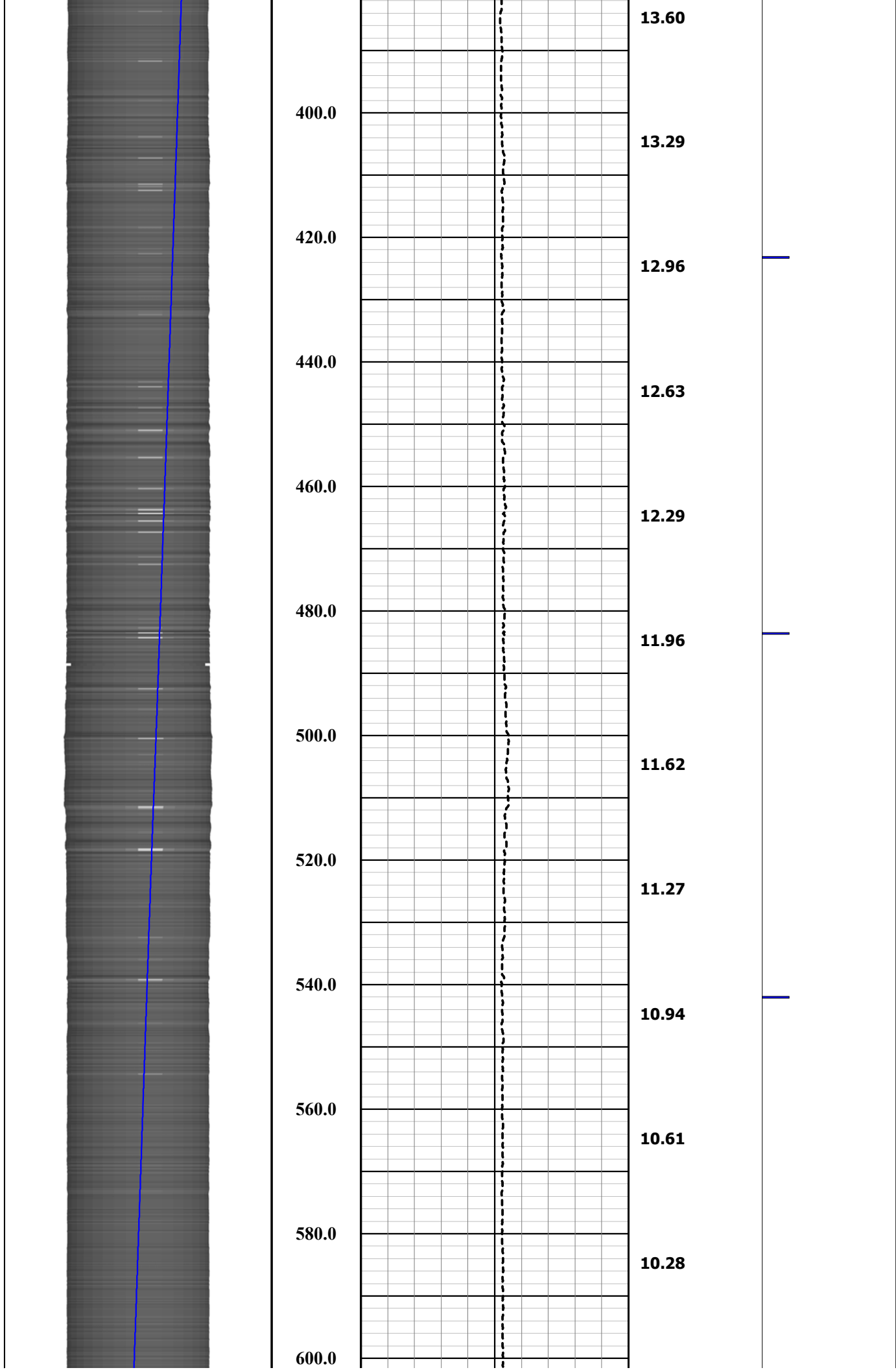
Tool Summary:					
Date	3-9-17	Date	3-9-17	Date	3-9-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	MSI E-LOG 40GRP	Tool Model	MSI 60mm SONIC
Tool SN	4953	Tool SN	5513	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1202 FT.	To	1202 FT.	To	1202 FT.
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	A. OLSON
Truck No	310	Truck No	310	Truck No	310
Operation Check	3-7-17	Operation Check	3-7-17	Operation Check	3-7-17
Calibration Check	3-7-17	Calibration Check	3-7-17	Calibration Check	N/A
Time Logged	1:25 P.M.	Time Logged	2:20 P.M.	Time Logged	3:00 P.M.
Date	3-9-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model		Tool Model	
Tool SN	6002	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1202 FT.	To		To	
Recorded By	A. OLSON	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	3-7-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	4:00 P.M.	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: 15 IN.			Calibration Points: 8 IN. & 23 IN.		

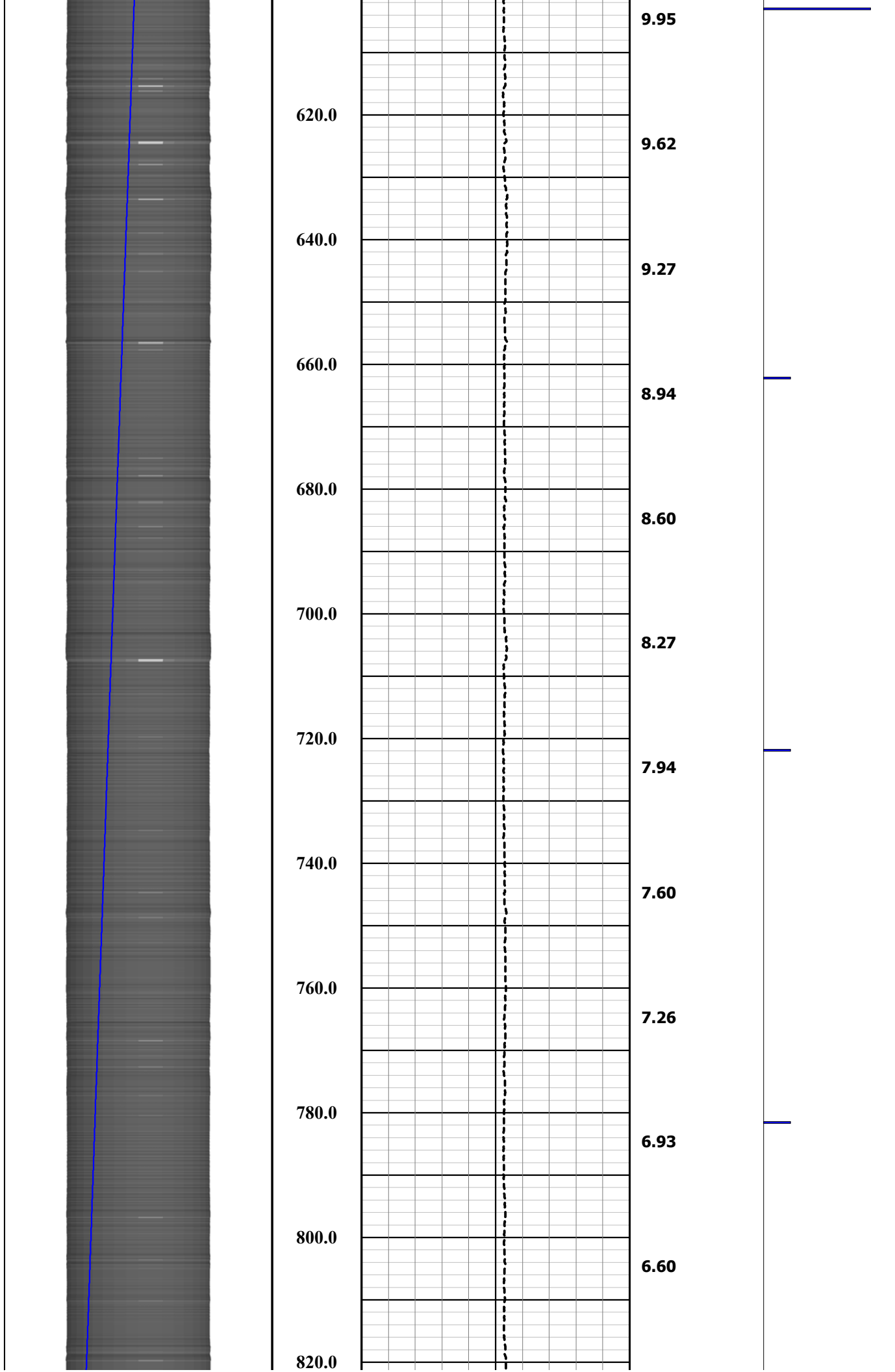
Disclaimer:

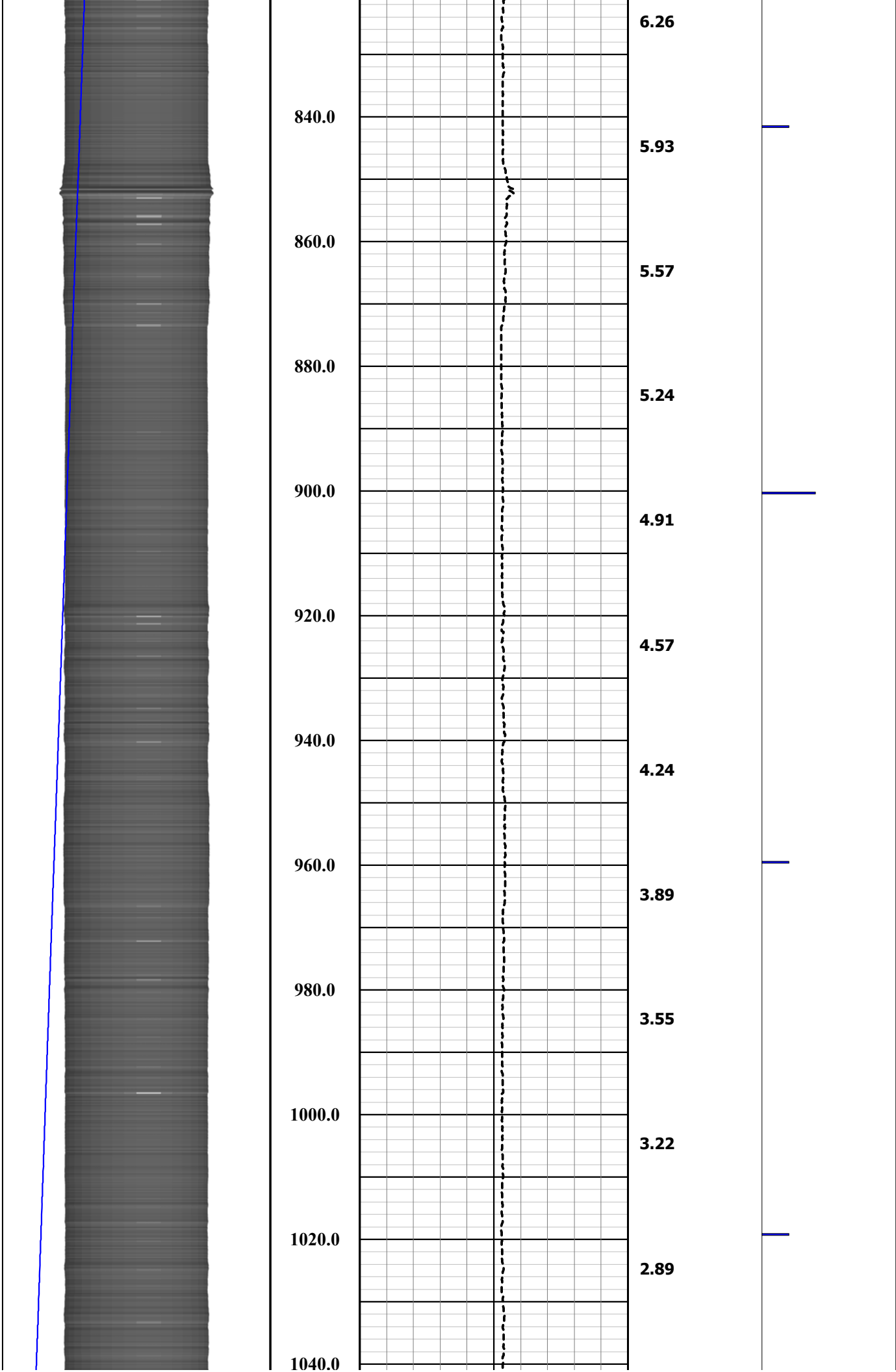
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

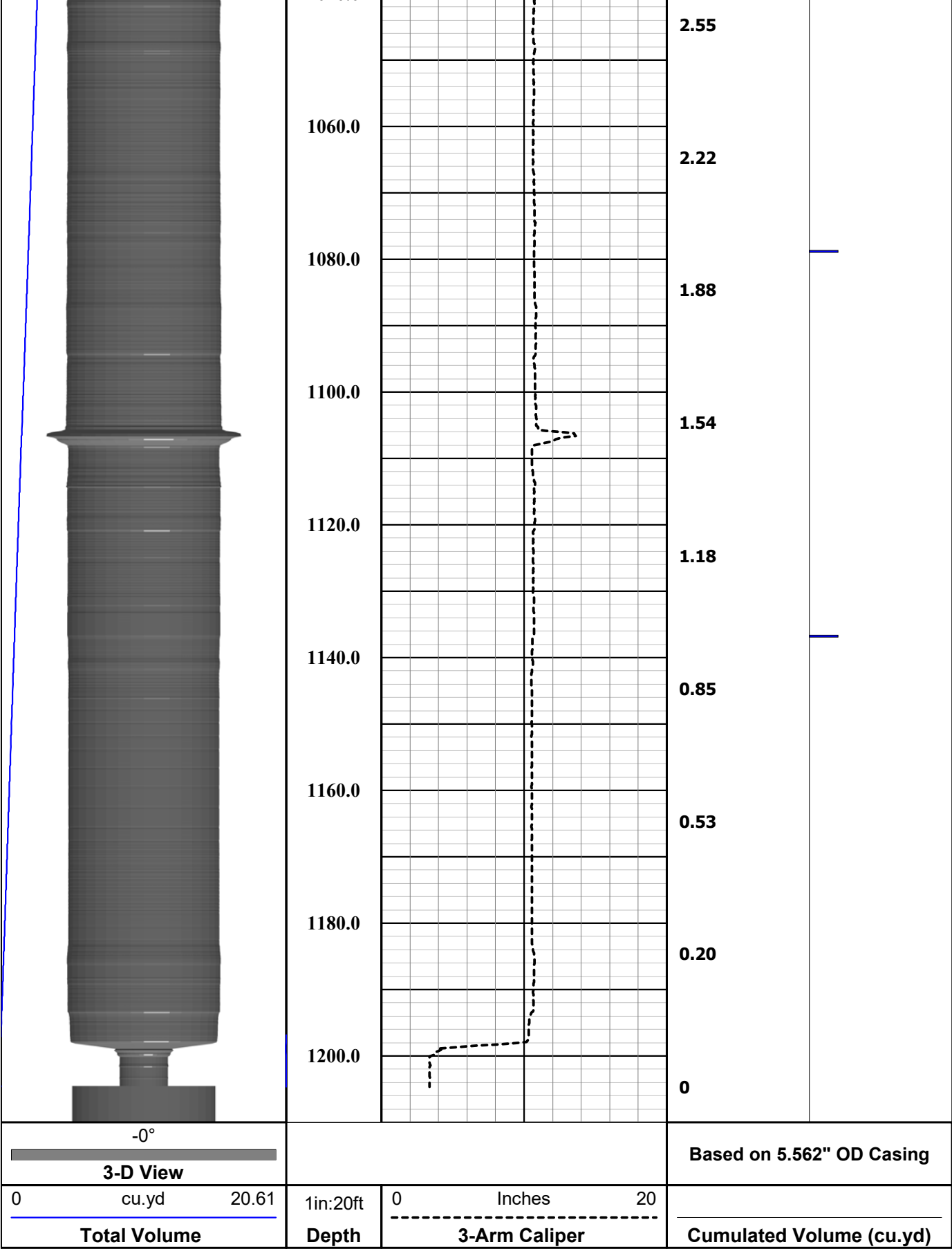












MSI Gamma-Caliper-Temperature-Fluid Resistivity SN 4953

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

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Available Arm Sizes: 3", 9", and 15"

———— TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



**Southwest Exploration
Services, LLC**

Company FLORENCE COPPER

Well M57-0
Field FLORENCE COPPER



borehole geophysics & video services

County
State

PINAL
ARIZONA

Final

Caliper Volume Calc. Summary

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

FLORENCE COPPER

M57-0

Thursday - March 9, 2017



**Southwest Exploration
Services, LLC**

borehole geophysics & video services

This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	FLORENCE COPPER			Well Owner:								
County:	PINAL	State:	Arizona	Country:	USA							
Well Number:	M57-0	Survey Date:	Thursday - March 9, 2017	Magnetic Declination:	Declination Correction Not Used							
Field:	FLORENCE COPPER		Drift Calculation Methodology:	Balanced Tangential Method								
Location:												
Remarks:												
Witness:	AARON - NATIONAL	Vehicle No.:	310	Invoice No.:								
				Operator:	A. OLSON	Well Depth:	1200 Feet	Casing size:	10.625 Inches			
Tool:	Compass - 6002		Lat.:		Long.:		Sec.:		Twp.:		Rge.:	

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
20	0.09	288.70	20.00						
40	0.37	317.58	39.99	0.053	-0.058	0.42	1.18	0.08' (.96")	312.00
60	0.18	223.45	59.98	0.078	-0.123	0.96	3.48	0.15' (1.80")	302.30
80	0.08	263.49	79.97	0.054	-0.158	0.84	1.63	0.17' (2.04")	288.70
100	0.37	191.71	99.97	-0.011	-0.185	0.42	2.78	0.19' (2.28")	266.70
120	0.18	178.64	119.96	-0.106	-0.197	0.14	0.54	0.22' (2.64")	241.80
140	0.55	279.28	139.95	-0.122	-0.291	0.43	3.65	0.32' (3.84")	247.30
160	0.14	153.56	159.94	-0.128	-0.375	0.83	4.23	0.40' (4.80")	251.10
180	0.05	247.14	179.93	-0.153	-0.372	0.95	3.46	0.40' (4.80")	247.60
200	0.13	269.26	199.92	-0.157	-0.403	0.38	0.91	0.43' (5.16")	248.70
220	0.09	357.31	219.91	-0.142	-0.426	1.00	3.30	0.45' (5.40")	251.60
240	0.02	171.20	239.90	-0.130	-0.426	1.00	4.74	0.45' (5.40")	253.10
260	0.04	273.37	259.89	-0.133	-0.432	0.35	3.69	0.45' (5.40")	252.90
280	0.29	322.80	279.88	-0.092	-0.470	0.93	1.99	0.48' (5.76")	258.90
300	0.58	289.90	299.87	-0.017	-0.596	0.79	1.34	0.60' (7.20")	268.30
320	0.30	302.29	319.86	0.045	-0.735	0.51	0.51	0.74' (8.88")	273.50
340	0.32	279.65	339.85	0.082	-0.834	0.01	0.93	0.84' (10.08")	275.60
360	0.28	284.62	359.84	0.104	-0.936	0.54	0.21	0.94' (11.28")	276.30

Page No. 1

True Vertical Depth: 1199.43'

Final Drift Distance: 7.75' (93.00")

Final Drift Bearing: 288.80°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

M57-0

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
380	0.12°	260.52°	379.83	0.113	-1.004	0.74	0.99	1.01' (12.12")	276.40
400	0.05°	139.45°	399.82	0.103	-1.019	0.89	4.13	1.02' (12.24")	275.80
420	0.34°	325.51°	419.81	0.145	-1.047	0.22	4.74	1.06' (12.72")	277.90
440	0.15°	254.25°	439.80	0.187	-1.106	0.97	2.77	1.12' (13.44")	279.60
460	0.43°	328.61°	459.79	0.244	-1.170	0.97	2.87	1.20' (14.40")	281.80
480	0.70°	335.44°	479.78	0.419	-1.260	0.15	0.28	1.33' (15.96")	288.40
500	0.25°	296.26°	499.77	0.549	-1.350	0.83	1.59	1.46' (17.52")	292.10
520	0.49°	308.58°	519.76	0.622	-1.456	0.61	0.51	1.58' (18.96")	293.10
540	0.56°	334.94°	539.75	0.764	-1.564	0.71	1.08	1.74' (20.88")	296.00
560	0.70°	231.28°	559.74	0.776	-1.701	0.25	3.73	1.87' (22.44")	294.50
580	0.39°	308.57°	579.73	0.742	-1.850	0.76	2.97	1.99' (23.88")	291.90
600	0.62°	309.74°	599.72	0.854	-1.986	0.51	0.05	2.16' (25.92")	293.30
620	0.39°	317.17°	619.71	0.973	-2.115	0.71	0.31	2.33' (27.96")	294.70
640	0.43°	296.65°	639.70	1.057	-2.228	0.10	0.85	2.47' (29.64")	295.40
660	0.68°	303.97°	659.69	1.157	-2.394	0.84	0.30	2.66' (31.92")	295.80
680	0.54°	290.12°	679.68	1.256	-2.581	0.82	0.57	2.87' (34.44")	295.90
700	0.70°	294.52°	699.67	1.339	-2.781	0.21	0.18	3.09' (37.08")	295.70
720	0.50°	301.39°	719.66	1.435	-2.967	0.57	0.28	3.30' (39.60")	295.80
740	0.62°	285.67°	739.65	1.510	-3.146	0.27	0.65	3.49' (41.88")	295.60
760	0.51°	270.21°	759.64	1.540	-3.339	0.93	0.64	3.68' (44.16")	294.80
780	0.34°	291.94°	779.63	1.562	-3.483	0.62	0.90	3.82' (45.84")	294.20
800	0.58°	284.64°	799.62	1.610	-3.636	0.96	0.30	3.98' (47.76")	293.90
820	0.51°	281.87°	819.61	1.654	-3.821	0.10	0.11	4.16' (49.92")	293.40
840	0.57°	277.51°	839.60	1.685	-4.007	0.33	0.18	4.35' (52.20")	292.80
860	0.82°	262.74°	859.59	1.680	-4.248	0.54	0.61	4.57' (54.84")	291.60
880	0.70°	279.85°	879.58	1.683	-4.510	0.50	0.71	4.81' (57.72")	290.50
900	0.53°	289.55°	899.57	1.735	-4.718	0.46	0.40	5.03' (60.36")	290.20
920	0.61°	279.89°	919.56	1.784	-4.910	0.66	0.40	5.22' (62.64")	290.00
940	0.60°	291.73°	939.55	1.841	-5.112	0.09	0.49	5.43' (65.16")	289.80
960	0.61°	308.51°	959.54	1.946	-5.293	0.25	0.69	5.64' (67.68")	290.20
980	0.61°	279.75°	979.53	2.030	-5.481	0.99	1.18	5.85' (70.20")	290.30
1,000	0.60°	289.65°	999.53	2.083	-5.685	0.93	0.41	6.05' (72.60")	290.10
1,020	0.49°	277.09°	1,019.52	2.129	-5.868	0.97	0.52	6.24' (74.88")	289.90
Page No. 2			True Vertical Depth: <u>1199.43'</u>			Final Drift Distance: <u>7.75'</u> (93.00")		Final Drift Bearing: <u>288.80°</u>	

1 (480) 926-4558

[illegible]

Final Drift Bearing: 288.80°

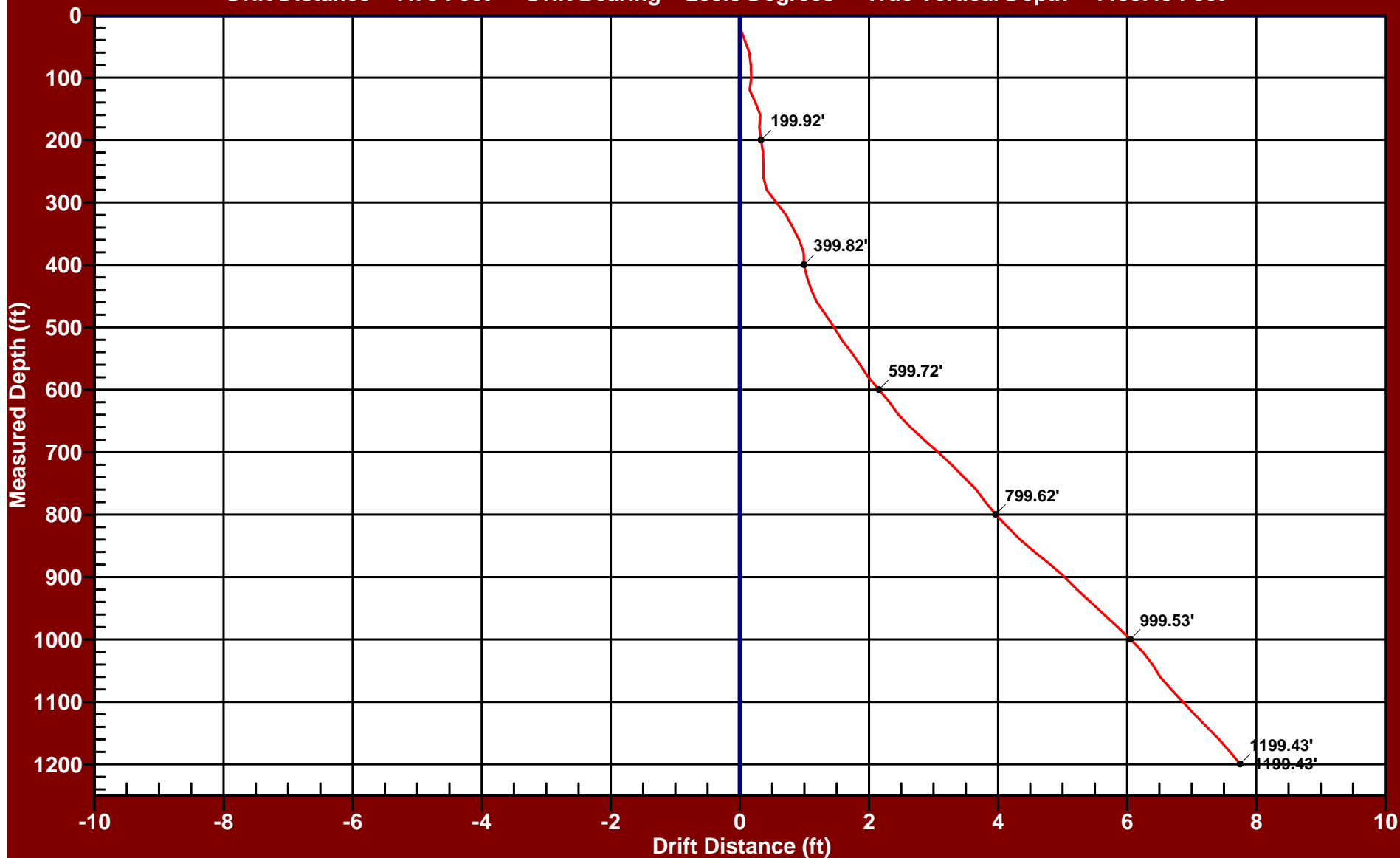
PLANE OF DRIFT VIEW - M57-0

FLORENCE COPPER

Drift Distance = 7.75 Feet

Drift Bearing = 288.8 Degrees

True Vertical Depth = 1199.43 Feet



Date of Survey: Thursday - March 9, 2017

Balanced Tangential Calculation Method

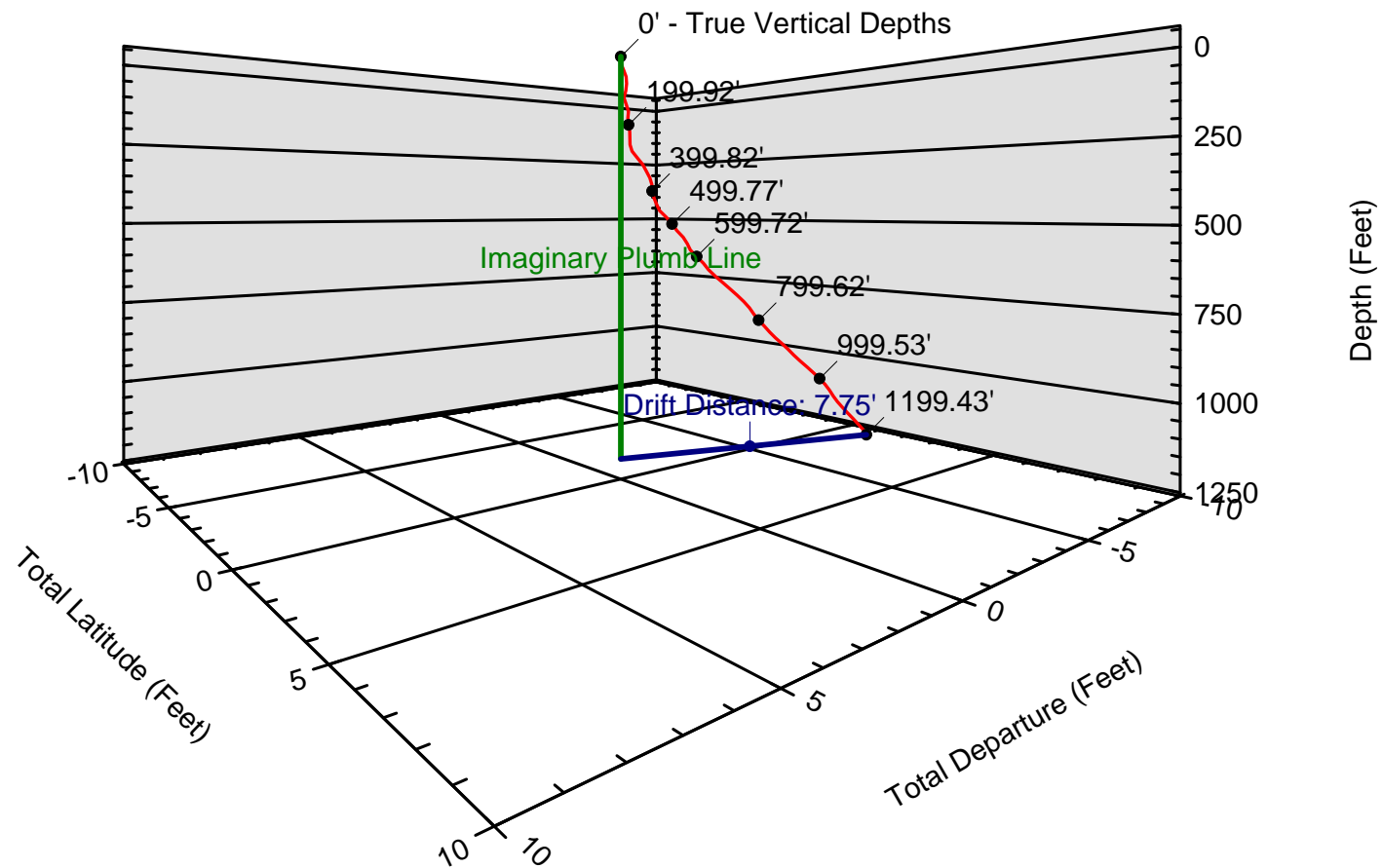
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3D PROJECTION VIEW - M57-0

FLORENCE COPPER

Drift Distance = 7.75 Feet Drift Bearing = 288.8 Degrees True Vertical Depth = 1199.43 Feet

321.0



Date of Survey: Thursday - March 9, 2017

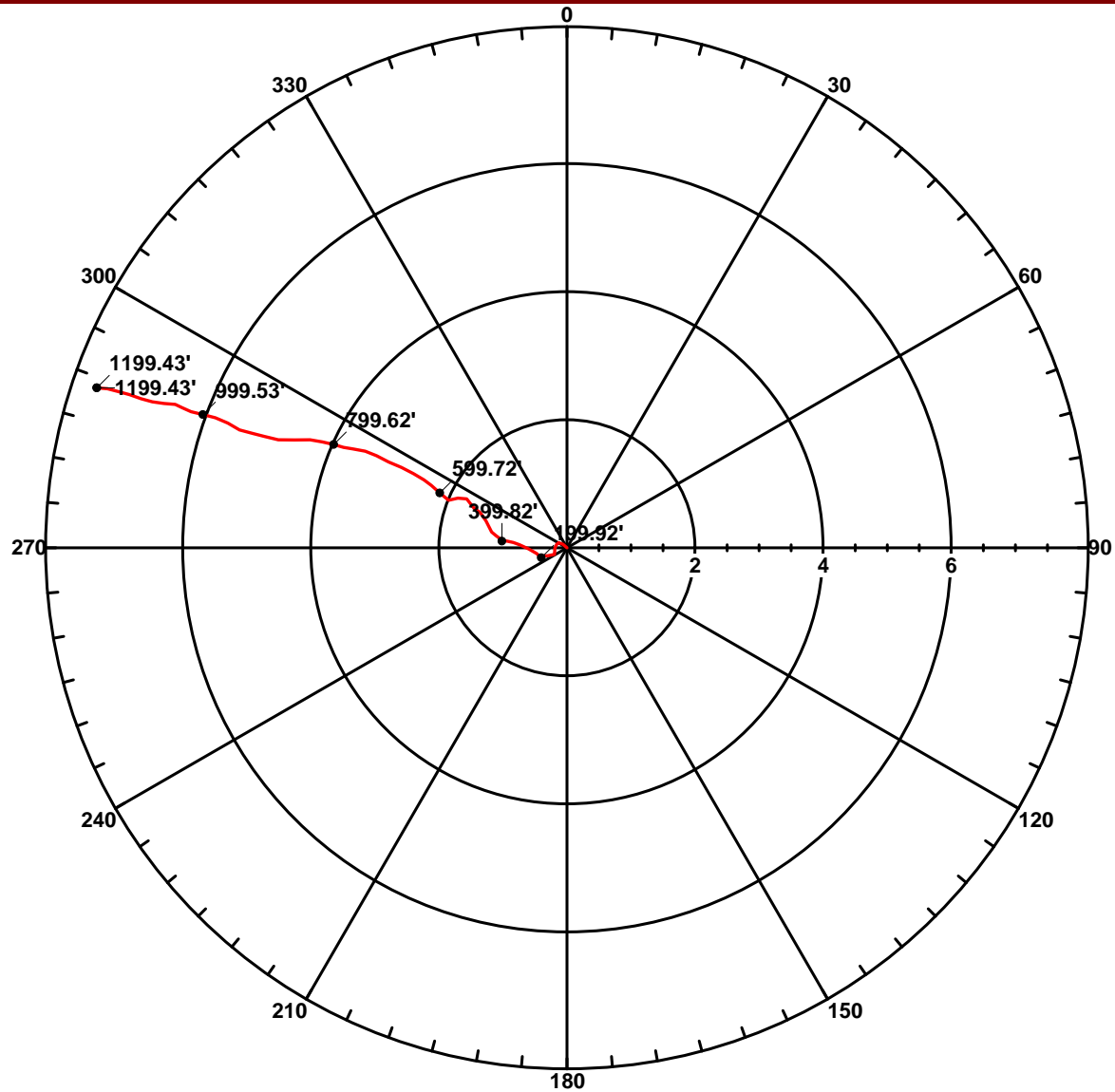
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - M57-0

FLORENCE COPPER

Drift Distance = 7.75 Feet Drift Bearing = 288.8 Degrees True Vertical Depth = 1199.43 Feet



Date of Survey: Thursday - March 9, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

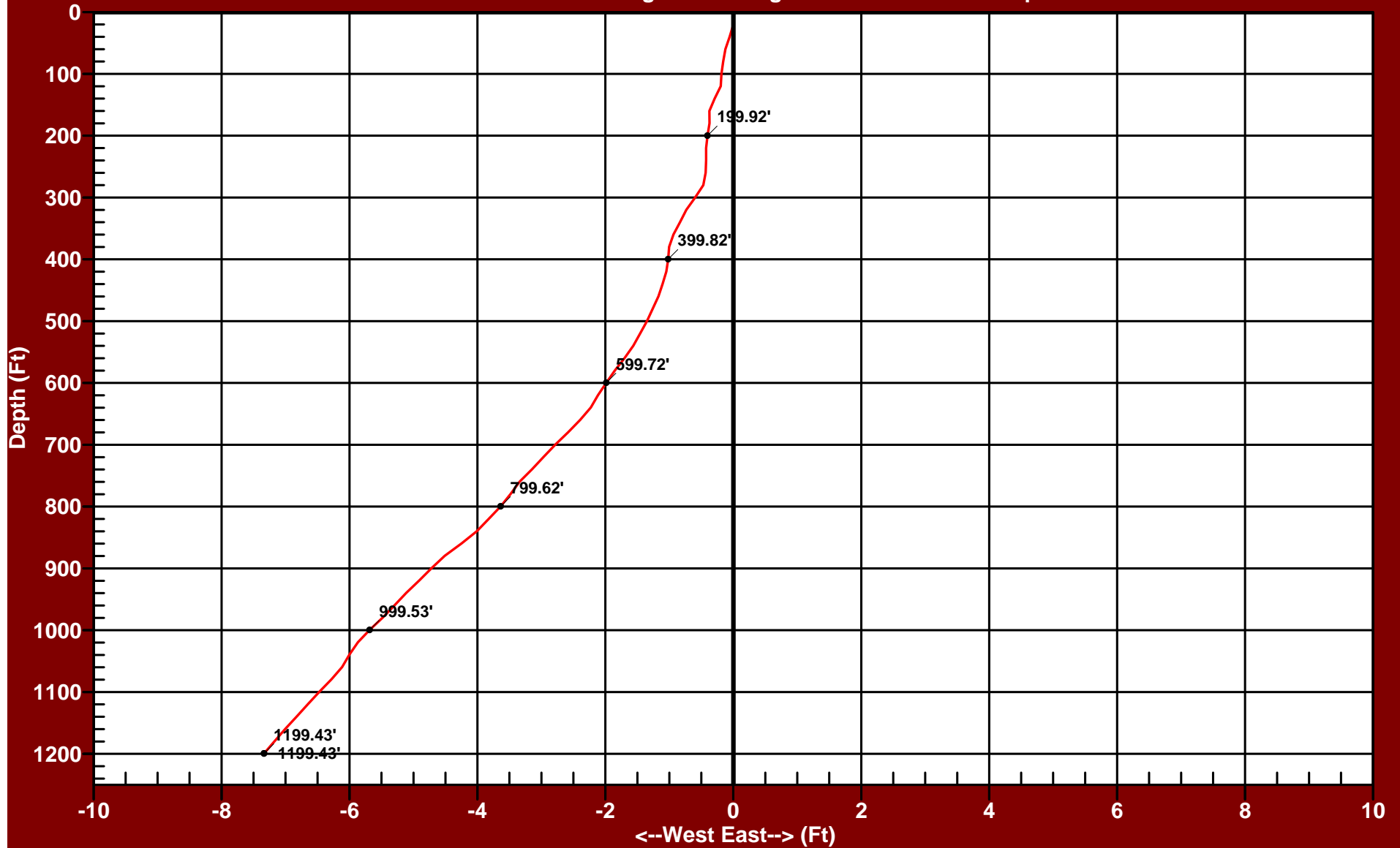
EASTING RECTANGULAR VIEW - M57-0

FLORENCE COPPER

Drift Distance = 7.75 Feet

Drift Bearing = 288.8 Degrees

True Vertical Depth = 1199.43 Feet



Date of Survey: Thursday - March 9, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

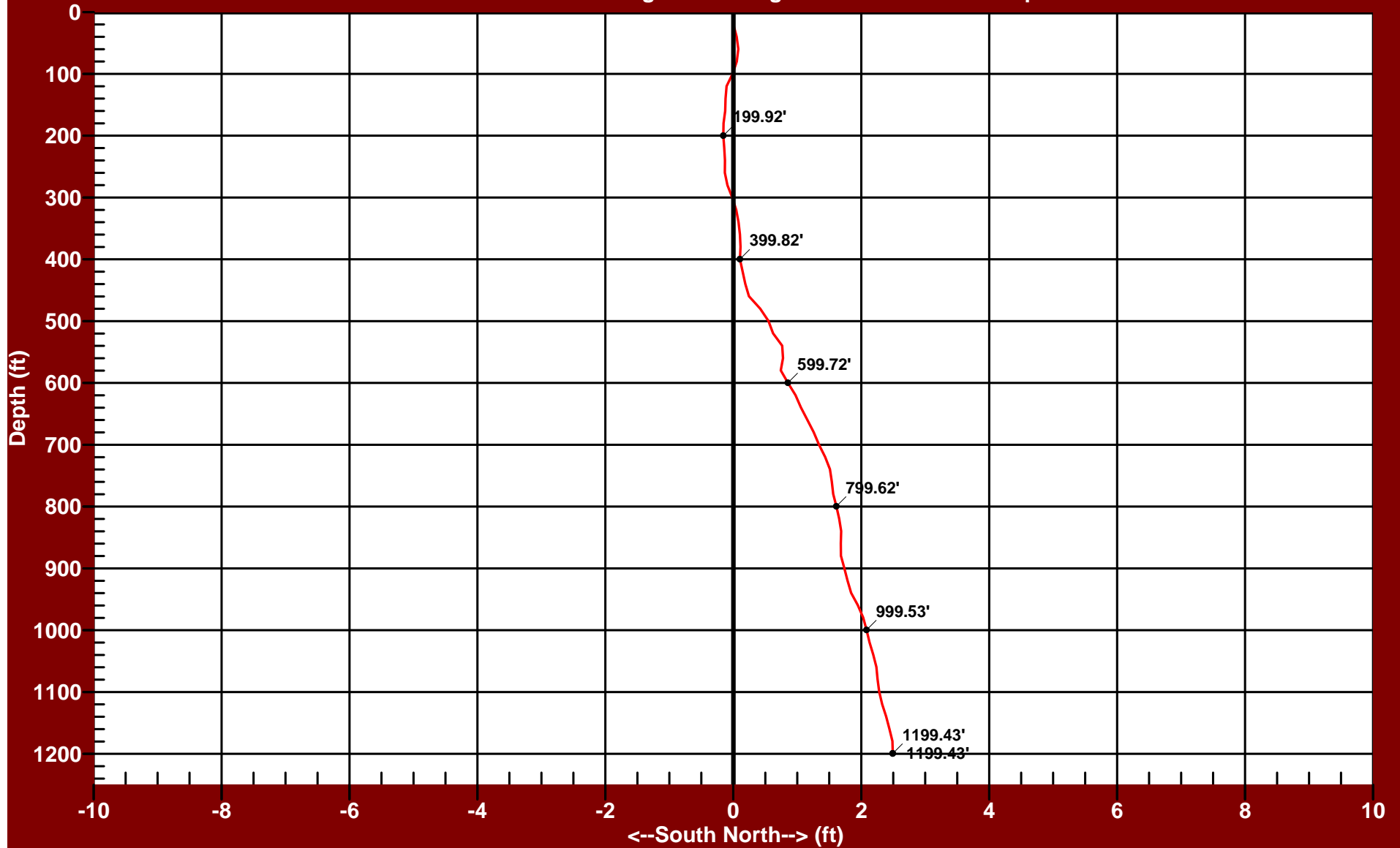
NORTHING RECTANGULAR VIEW - M57-0

FLORENCE COPPER

Drift Distance = 7.75 Feet

Drift Bearing = 288.8 Degrees

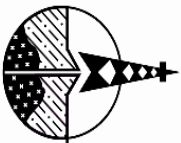
True Vertical Depth = 1199.43 Feet



Date of Survey: Thursday - March 9, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY FLORENCE COPPER							
WELL ID M7-0							
FIELD FLORENCE COPPER							
COUNTY PINAL	STATE ARIZONA						
TYPE OF LOGS: GAMMA - TFR							
MORE:	OTHER SERVICES						
LOCATION	4 PI DENSITY SONIC						
SEC	TWP	RGE					
PERMANENT DATUM		ELEVATION	K.B.				
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.				
DRILLING MEAS. FROM	GROUND LEVEL		G.L.				
DATE	03-15-17	TYPE FLUID IN HOLE	MUD				
RUN No	1	MUD WEIGHT	N/A				
TYPE LOG	GAMMA - TFR	VISCOSITY	N/A				
DEPTH-DRILLER	1200.0 FT	LEVEL	273.5 FT				
DEPTH-LOGGER	1203.0 FT	MAX. REC. TEMP.	30.7 DEG. C				
BTM LOGGED INTERVAL	1203.0 FT	IMAGE ORIENTED TO:	N/A				
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT				
DRILLER / RIG#	NATIONAL	LOGGING TRUCK	TRUCK #900				
RECORDED BY / Logging Eng.	E. BEAM	TOOL STRING/SN	MSI COMBO TOOL SN 4183				
WITNESSED BY	MATT - H&A	LOG TIME:ON SITE/OFF SITE	9:30 AM				
BOREHOLE RECORD		CASING RECORD					
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT	14 IN	STEEL	SURFACE	40 FT
2	10 5/8 IN	40 FT	TOTAL DEPTH	5 IN	STEEL	40 FT	525 FT
3				5 IN	PVC	525 FT	TOTAL DEPTH
COMMENTS:							

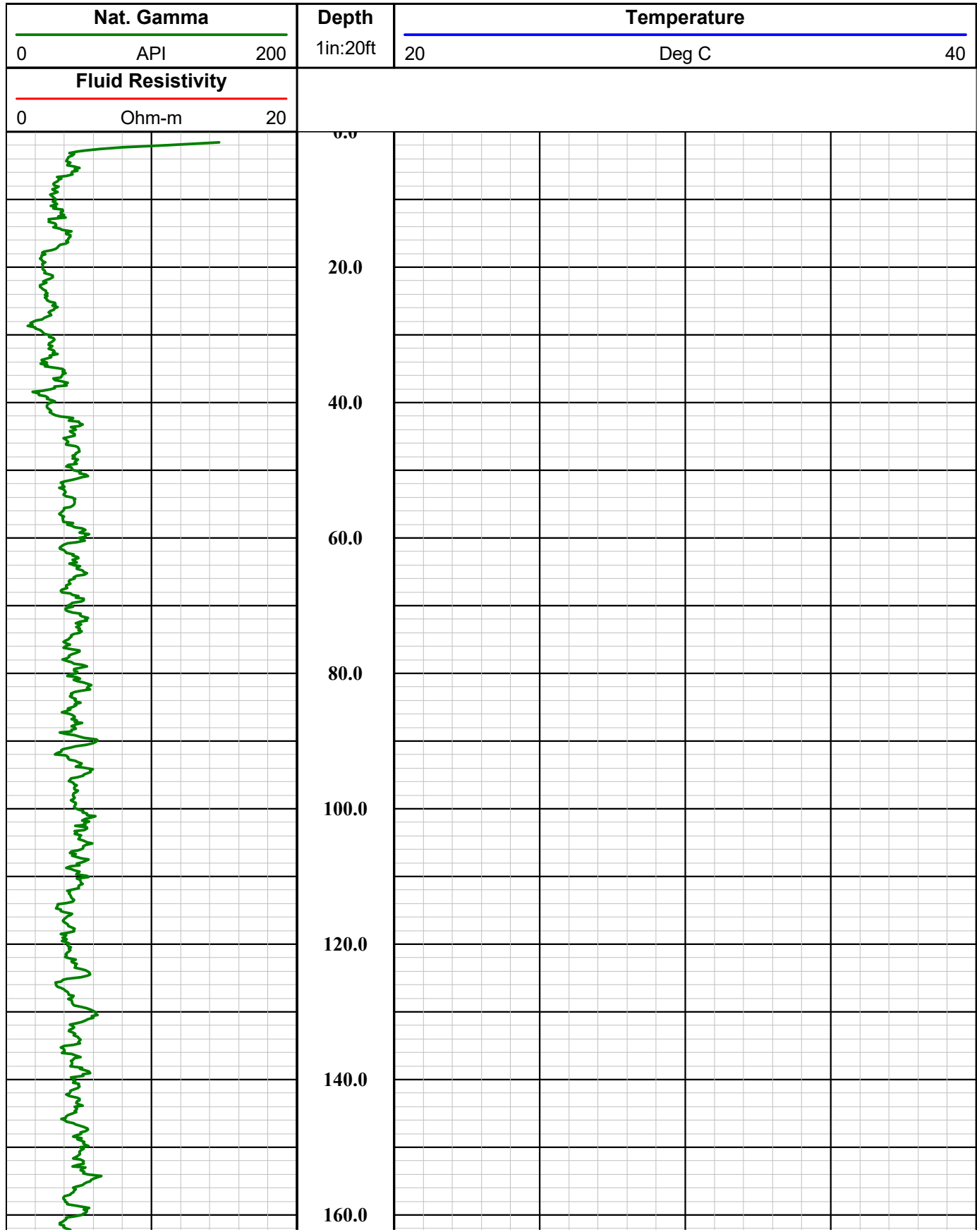
Tool Summary:					
Date	03-15-17	Date	03-15-17	Date	03-15-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	ALT 4 RX SONIC	Tool Model	COMPROBE 4 PI
Tool SN	4183	Tool SN	5185	Tool SN	6009
From	SURFACE	From	270.0 FT	From	SURFACE
To	1203.0 FT	To	700.0 FT	To	550.0 FT
Recorded By	E. BEAM	Recorded By	E. BEAM	Recorded By	E. BEAM
Truck No	900	Truck No	900	Truck No	900
Operation Check	03-14-17	Operation Check	03-14-17	Operation Check	03-14-17
Calibration Check	N/A	Calibration Check	N/A	Calibration Check	N/A
Time Logged	9:30 AM	Time Logged	10:45 AM	Time Logged	11:40 AM
Date	03-15-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	2GDA	Tool Model		Tool Model	
Tool SN	3083	Tool SN		Tool SN	
From	SURFACE	From		From	
To	550.0 FT	To		To	
Recorded By	E. BEAM	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	03-14-17	Operation Check		Operation Check	
Calibration Check	03-14-17	Calibration Check		Calibration Check	
Time Logged	12:45 PM	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: N/A					
Calibration Points: N/A					

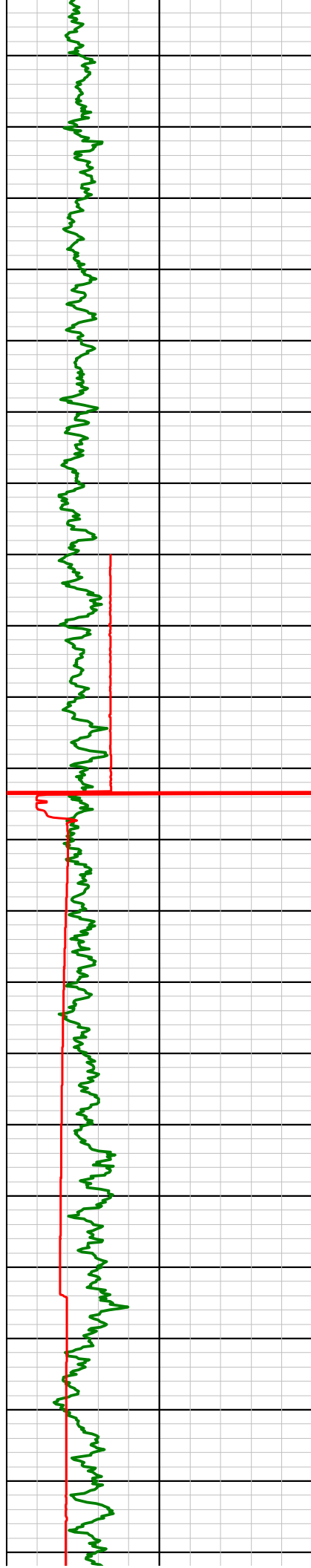
E-Log Calibration Range: N/A

Calibration Points: N/A

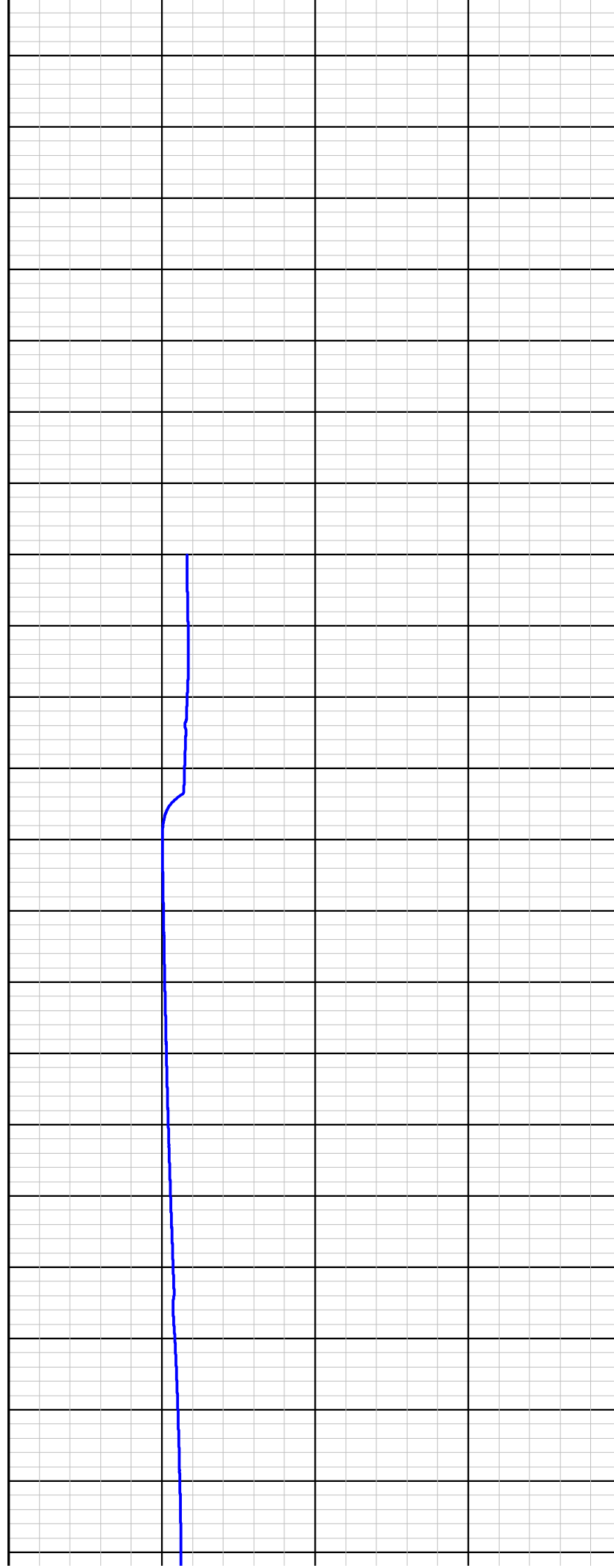
Disclaimer:

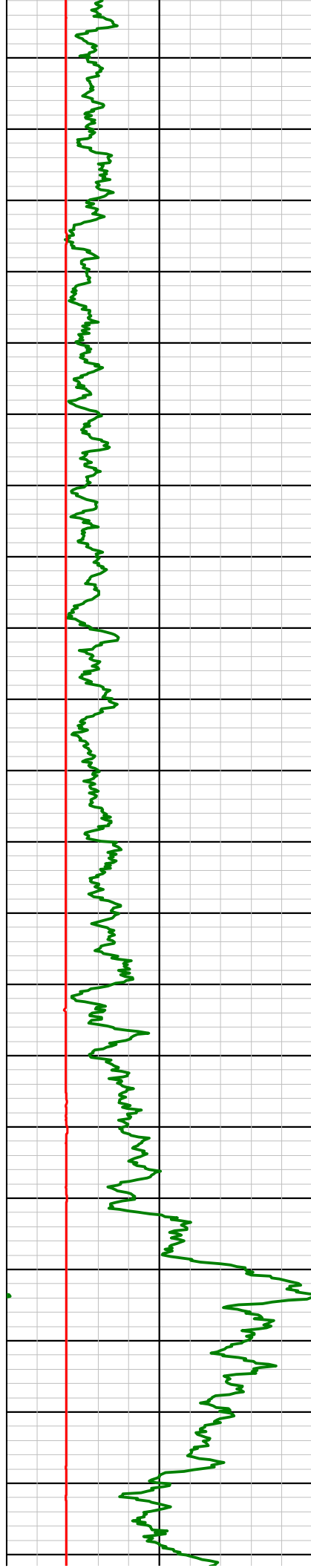
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.





180.0
200.0
220.0
240.0
260.0
280.0
300.0
320.0
340.0
360.0
380.0





400.0

420.0

440.0

460.0

480.0

500.0

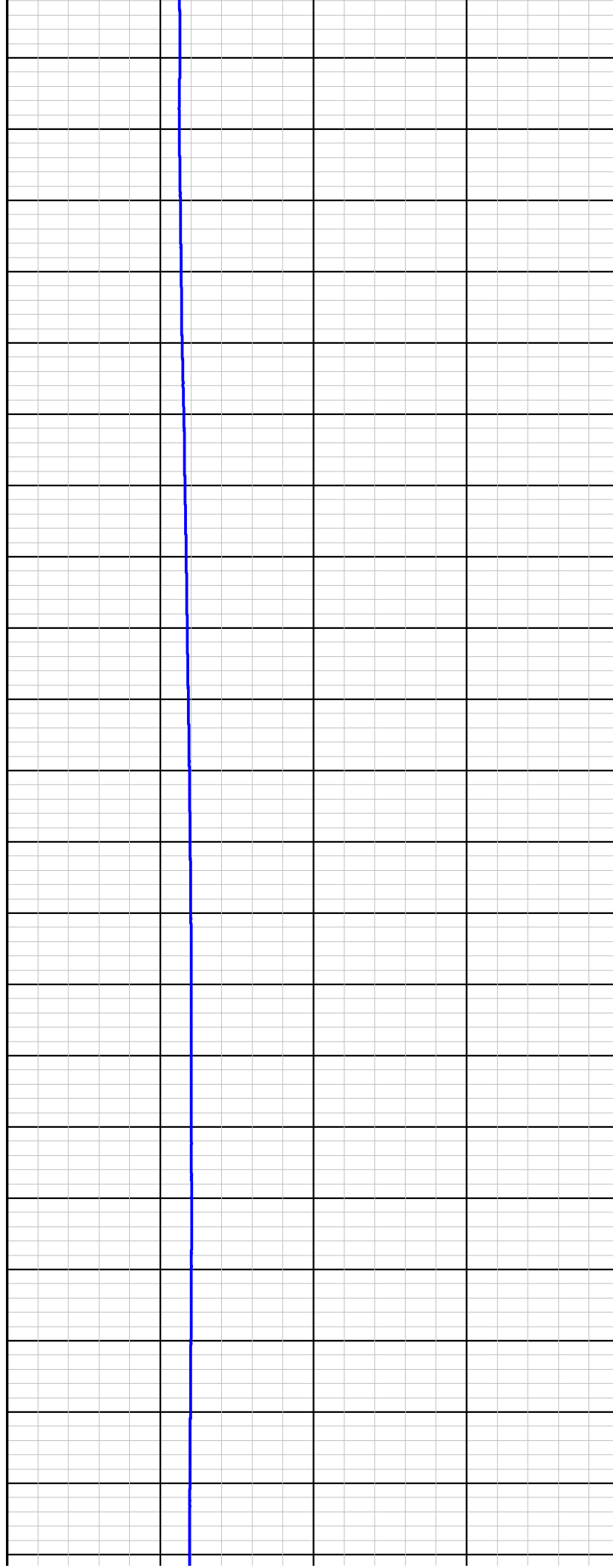
520.0

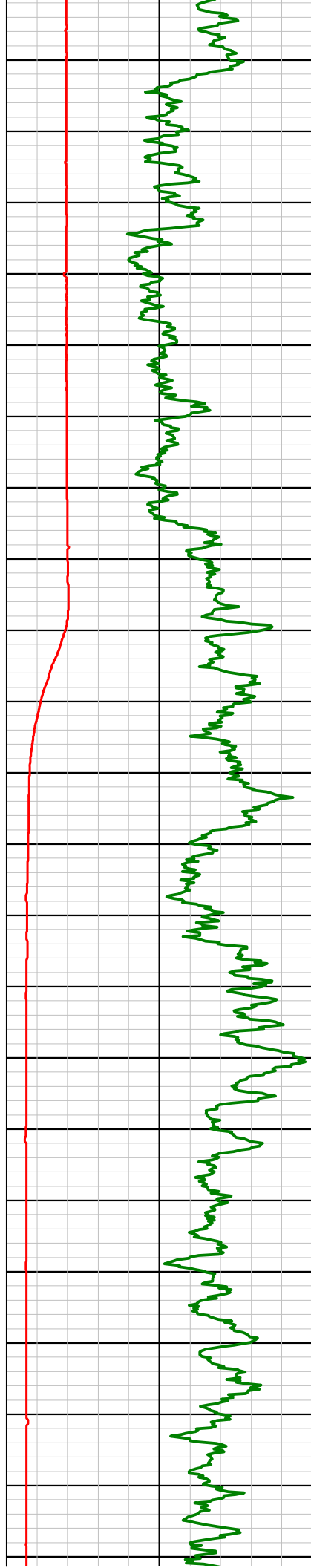
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560.0

580.0

600.0





620.0

640.0

660.0

680.0

700.0

720.0

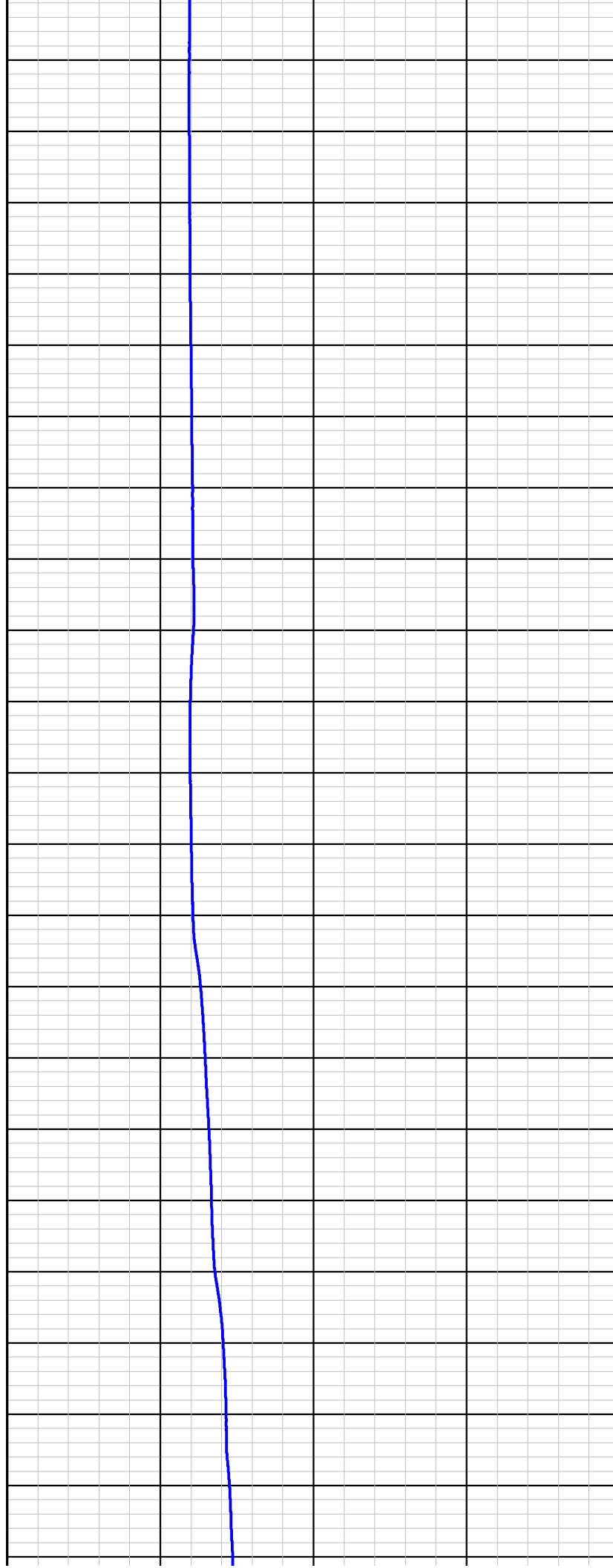
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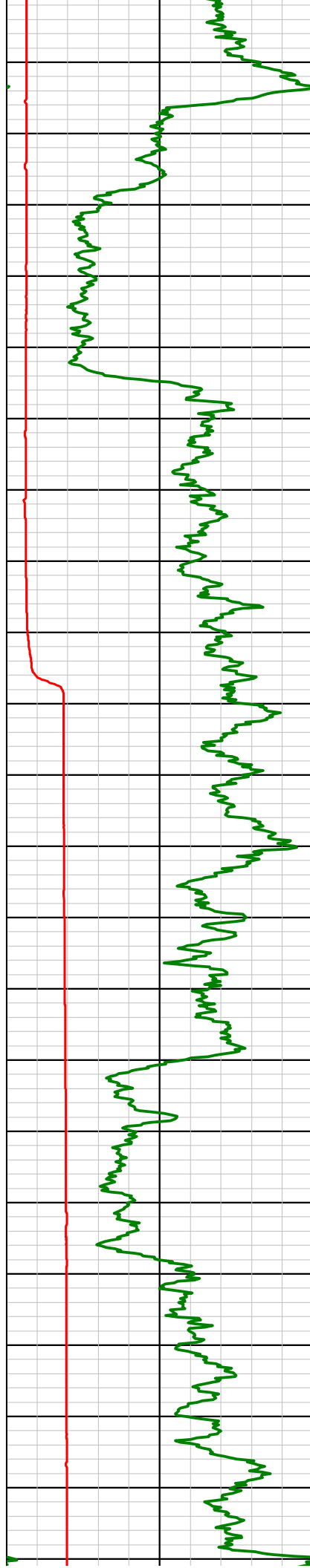
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800.0

820.0





840.0

860.0

880.0

900.0

920.0

940.0

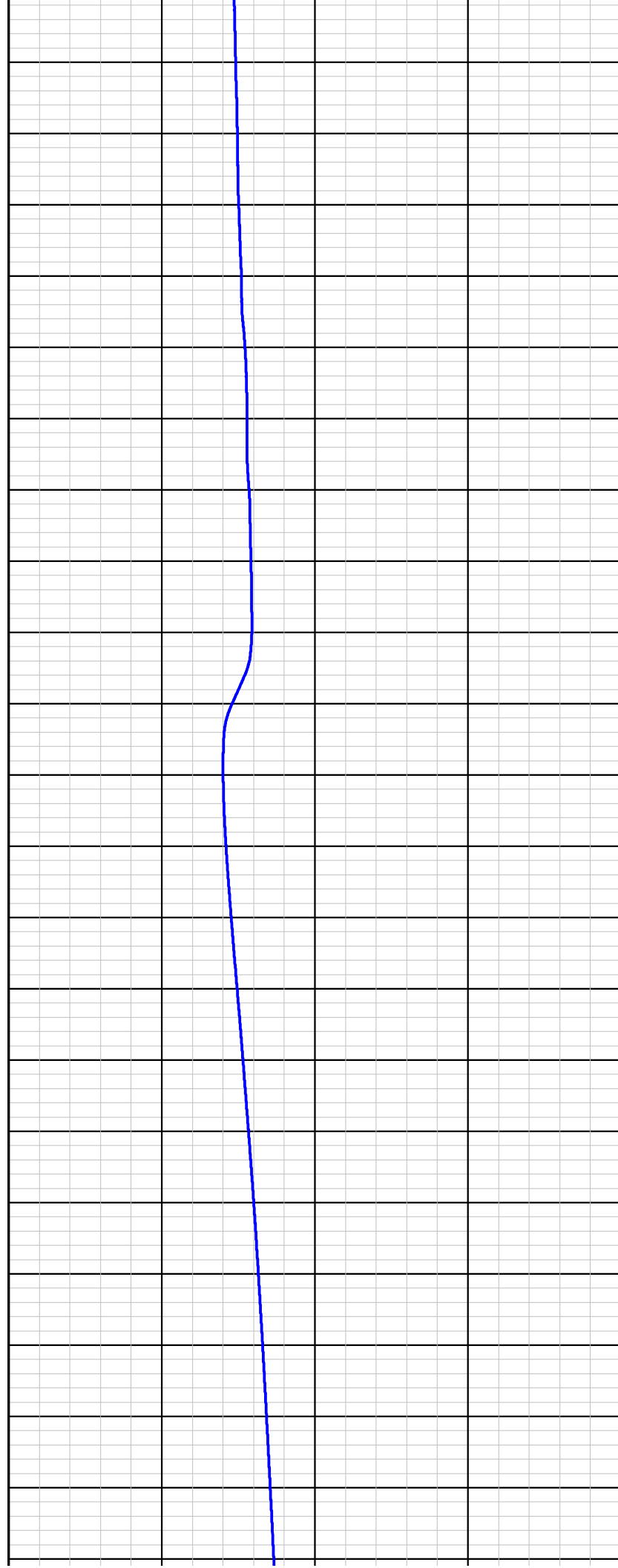
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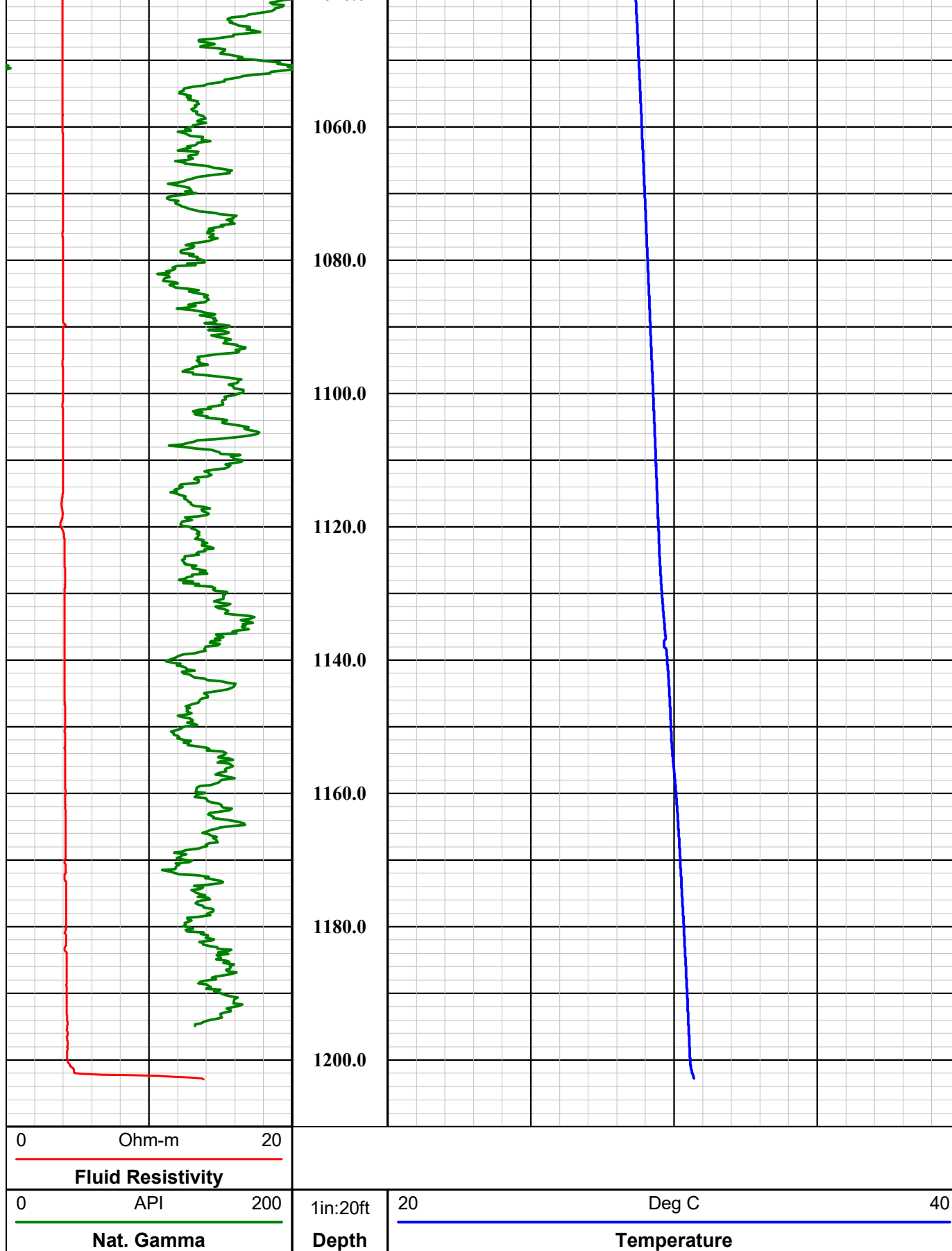
980.0

1000.0

1020.0

1040.0





Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	M57-0
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Preliminary

GCT Summary

APPENDIX F

SAPT Documentation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STANDARD ANNULAR PRESSURE TEST

Operator FLORENCE COPPER, INC

State Permit No. P-101704

Address 1575 W. HUNT HWY

USEPA Permit No. R9UIC-AZ3-FY11-1

FLORENCE, AZ 85132

Date of Test 6/14/2017

Well Name M57-O

Well Type CLASS III - SUPPL. MONITORING

LOCATION INFORMATION SE Quarter of the NW Quarter of the SW Quarter

of Section 28 ; Range 9E ; Township 4S ; County PINAL ;

Company Representative IAN REAM ; Field Inspector LAUREN CANDREVA ;

Type of Pressure Gauge Pressure transducer with data logger inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes ☒ No ☐ If no, date of calibration Calibration certification submitted? Yes ☐ No ☒

TEST RESULTS

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☐ No ☒

2-year test for TA'd wells on time? Yes ☐ No ☒

After rework? Yes ☐ No ☒

Newly permitted well? Yes ☒ No ☐

Pressure (in psig)

Time	Annulus	Tubing
<u>12:44</u>	<u>126.74</u>	<u>same</u>
<u>12:54</u>	<u>125.39</u>	<u>same</u>
<u>13:04</u>	<u>124.02</u>	<u>same</u>
<u>13:14</u>	<u>122.83</u>	<u>same</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

Casing size 5" - NOMINAL

Tubing size 2"

Packer type INFLATABLE

Packer set @ 489.69

Top of Permitted Injection Zone 505'

Is packer 100 ft or less above top of

Injection Zone ? Yes ☒ No ☐

If not, please submit a justification.

Fluid return (gal.) 5.05

Comments: Two tests were run to confirm results, one test is presented on the form, both tests are included in the attached chart and table.

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.05 6.34 psi

Test Period Pressure change 3.91 psi

Test Passed ☒ Test Failed ☐

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

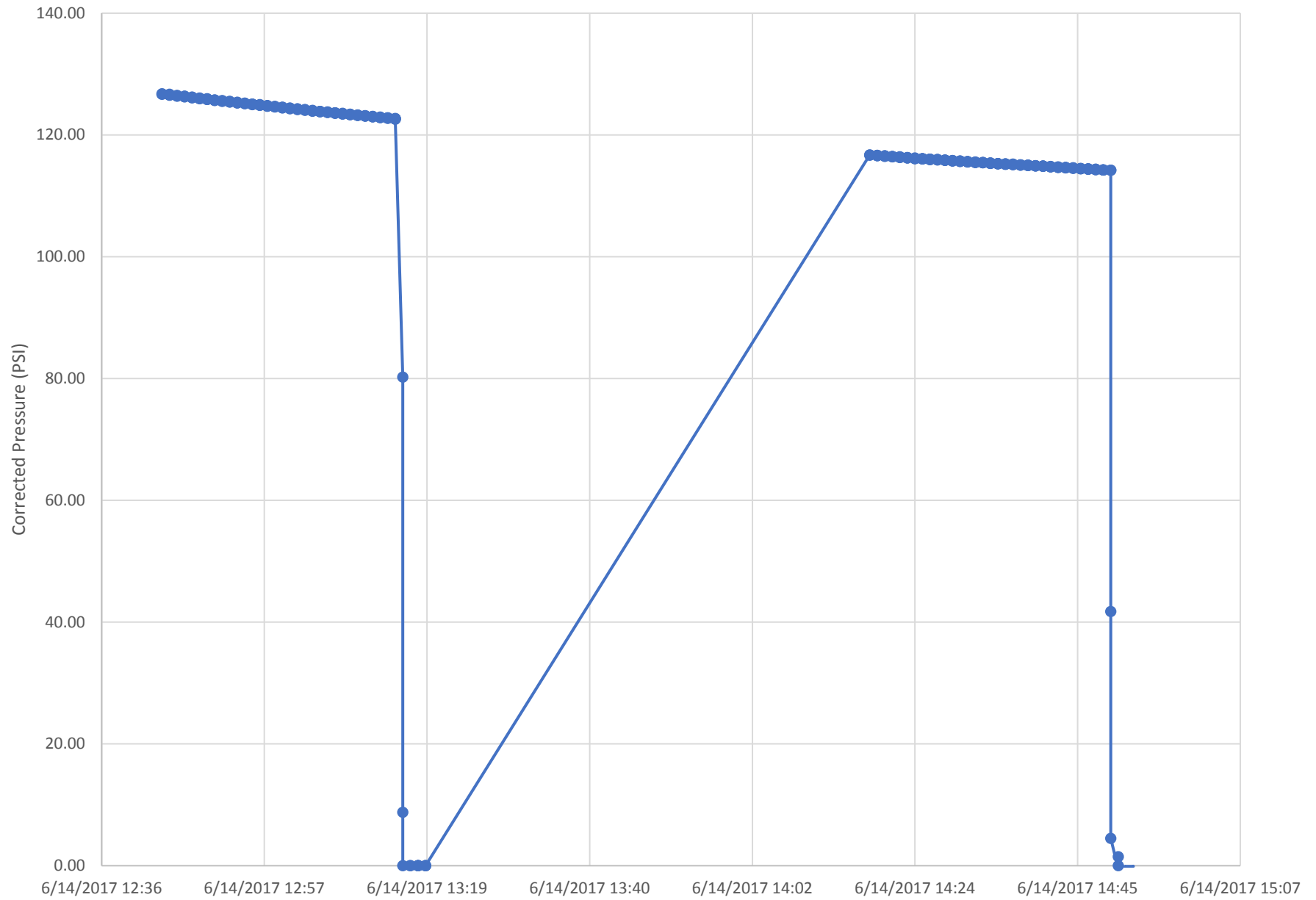
I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream
Printed Name of Company Representative

[Signature]
Signature of Company Representative

6-14-2017
Date

M57-O Standard Annular Pressure Test Data



Well M57-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented	300 psi
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/14/2017 12:44	140.58	126.74
6/14/2017 12:44	140.53	126.69
6/14/2017 12:45	140.50	126.67
6/14/2017 12:45	140.44	126.61
6/14/2017 12:45	140.41	126.57
6/14/2017 12:45	140.37	126.53
6/14/2017 12:46	140.32	126.49
6/14/2017 12:46	140.29	126.46
6/14/2017 12:46	140.26	126.42
6/14/2017 12:46	140.22	126.39
6/14/2017 12:47	140.21	126.38
6/14/2017 12:47	140.16	126.33
6/14/2017 12:47	140.13	126.30
6/14/2017 12:47	140.08	126.25
6/14/2017 12:48	140.05	126.22
6/14/2017 12:48	140.02	126.19
6/14/2017 12:48	139.97	126.14
6/14/2017 12:48	139.93	126.10
6/14/2017 12:49	139.91	126.07
6/14/2017 12:49	139.87	126.04
6/14/2017 12:49	139.82	125.98
6/14/2017 12:49	139.79	125.95
6/14/2017 12:50	139.77	125.94
6/14/2017 12:50	139.73	125.90
6/14/2017 12:50	139.67	125.83
6/14/2017 12:50	139.66	125.83
6/14/2017 12:51	139.60	125.76
6/14/2017 12:51	139.57	125.73
6/14/2017 12:51	139.51	125.68
6/14/2017 12:51	139.53	125.69
6/14/2017 12:52	139.48	125.65
6/14/2017 12:52	139.43	125.60
6/14/2017 12:52	139.40	125.57
6/14/2017 12:52	139.36	125.53
6/14/2017 12:53	139.34	125.51
6/14/2017 12:53	139.28	125.45
6/14/2017 12:53	139.276	125.44
6/14/2017 12:53	139.243	125.41
6/14/2017 12:54	139.22	125.39
6/14/2017 12:54	139.147	125.31
6/14/2017 12:54	139.127	125.29

Well M57-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented	300 psi
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/14/2017 12:54	139.103	125.27
6/14/2017 12:55	139.061	125.23
6/14/2017 12:55	139.037	125.20
6/14/2017 12:55	139.011	125.18
6/14/2017 12:55	138.966	125.13
6/14/2017 12:56	138.915	125.08
6/14/2017 12:56	138.899	125.07
6/14/2017 12:56	138.853	125.02
6/14/2017 12:56	138.821	124.99
6/14/2017 12:57	138.808	124.97
6/14/2017 12:57	138.754	124.92
6/14/2017 12:57	138.736	124.90
6/14/2017 12:57	138.698	124.86
6/14/2017 12:58	138.655	124.82
6/14/2017 12:58	138.635	124.80
6/14/2017 12:58	138.578	124.74
6/14/2017 12:58	138.567	124.73
6/14/2017 12:59	138.506	124.67
6/14/2017 12:59	138.5	124.67
6/14/2017 12:59	138.478	124.64
6/14/2017 12:59	138.435	124.60
6/14/2017 13:00	138.392	124.56
6/14/2017 13:00	138.363	124.53
6/14/2017 13:00	138.323	124.49
6/14/2017 13:00	138.278	124.44
6/14/2017 13:01	138.253	124.42
6/14/2017 13:01	138.23	124.40
6/14/2017 13:01	138.179	124.35
6/14/2017 13:01	138.168	124.33
6/14/2017 13:02	138.116	124.28
6/14/2017 13:02	138.095	124.26
6/14/2017 13:02	138.07	124.23
6/14/2017 13:02	138.02	124.18
6/14/2017 13:03	138.01	124.18
6/14/2017 13:03	137.95	124.12
6/14/2017 13:03	137.93	124.10
6/14/2017 13:03	137.91	124.08
6/14/2017 13:04	137.86	124.02
6/14/2017 13:04	137.85	124.02
6/14/2017 13:04	137.79	123.95
6/14/2017 13:04	137.75	123.92

Well M57-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented	300 psi
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/14/2017 13:05	137.71	123.88
6/14/2017 13:05	137.70	123.87
6/14/2017 13:05	137.66	123.83
6/14/2017 13:05	137.64	123.81
6/14/2017 13:06	137.63	123.79
6/14/2017 13:06	137.60	123.76
6/14/2017 13:06	137.54	123.70
6/14/2017 13:06	137.53	123.69
6/14/2017 13:07	137.48	123.65
6/14/2017 13:07	137.46	123.63
6/14/2017 13:07	137.45	123.61
6/14/2017 13:07	137.39	123.55
6/14/2017 13:08	137.38	123.55
6/14/2017 13:08	137.32	123.49
6/14/2017 13:08	137.31	123.48
6/14/2017 13:08	137.29	123.45
6/14/2017 13:09	137.23	123.40
6/14/2017 13:09	137.23	123.39
6/14/2017 13:09	137.19	123.36
6/14/2017 13:09	137.17	123.33
6/14/2017 13:10	137.12	123.29
6/14/2017 13:10	137.09	123.25
6/14/2017 13:10	137.08	123.24
6/14/2017 13:10	137.05	123.22
6/14/2017 13:11	136.99	123.15
6/14/2017 13:11	136.96	123.12
6/14/2017 13:11	136.95	123.12
6/14/2017 13:11	136.91	123.07
6/14/2017 13:12	136.88	123.04
6/14/2017 13:12	136.86	123.03
6/14/2017 13:12	136.85	123.01
6/14/2017 13:12	136.81	122.97
6/14/2017 13:13	136.76	122.93
6/14/2017 13:13	136.75	122.92
6/14/2017 13:13	136.71	122.88
6/14/2017 13:13	136.68	122.85
6/14/2017 13:14	136.67	122.83
6/14/2017 13:14	136.62	122.79
6/14/2017 13:14	136.60	122.77
6/14/2017 13:14	136.58	122.75
6/14/2017 13:15	136.53	122.70

Well M57-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented	300 psi
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/14/2017 13:15	136.51	122.67
6/14/2017 13:15	136.46	122.63
6/14/2017 13:15	136.44	122.61
6/14/2017 13:16	94.06	80.23
6/14/2017 13:16	22.59	8.76
6/14/2017 13:16	13.45	-0.38
6/14/2017 13:16	13.85	0.01
6/14/2017 13:17	13.83	0.00
6/14/2017 13:17	13.84	0.01
6/14/2017 13:17	13.83	0.00
6/14/2017 13:17	13.86	0.02
6/14/2017 13:18	13.86	0.03
6/14/2017 13:18	13.85	0.02
6/14/2017 13:18	13.85	0.02
6/14/2017 13:18	13.84	0.01
6/14/2017 13:19	13.84	0.01
6/14/2017 13:19	13.84	0.01
6/14/2017 13:19	13.83	0.00
6/14/2017 14:18	130.551	116.72
6/14/2017 14:18	130.535	116.70
6/14/2017 14:19	130.498	116.66
6/14/2017 14:19	130.486	116.65
6/14/2017 14:19	130.459	116.63
6/14/2017 14:19	130.455	116.62
6/14/2017 14:20	130.401	116.57
6/14/2017 14:20	130.383	116.55
6/14/2017 14:20	130.38	116.55
6/14/2017 14:20	130.333	116.50
6/14/2017 14:21	130.283	116.45
6/14/2017 14:21	130.276	116.44
6/14/2017 14:21	130.283	116.45
6/14/2017 14:21	130.239	116.41
6/14/2017 14:22	130.229	116.40
6/14/2017 14:22	130.19	116.36
6/14/2017 14:22	130.172	116.34
6/14/2017 14:22	130.134	116.30
6/14/2017 14:23	130.138	116.30
6/14/2017 14:23	130.088	116.25
6/14/2017 14:23	130.098	116.26
6/14/2017 14:23	130.042	116.21
6/14/2017 14:24	130.049	116.22

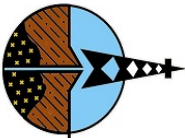
Well M57-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented	300 psi
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/14/2017 14:24	129.977	116.14
6/14/2017 14:24	129.961	116.13
6/14/2017 14:24	129.946	116.11
6/14/2017 14:25	129.94	116.11
6/14/2017 14:25	129.926	116.09
6/14/2017 14:25	129.914	116.08
6/14/2017 14:25	129.901	116.07
6/14/2017 14:26	129.864	116.03
6/14/2017 14:26	129.86	116.03
6/14/2017 14:26	129.828	115.99
6/14/2017 14:26	129.798	115.96
6/14/2017 14:27	129.806	115.97
6/14/2017 14:27	129.767	115.93
6/14/2017 14:27	129.739	115.91
6/14/2017 14:27	129.749	115.92
6/14/2017 14:28	129.701	115.87
6/14/2017 14:28	129.697	115.86
6/14/2017 14:28	129.682	115.85
6/14/2017 14:28	129.67	115.84
6/14/2017 14:29	129.646	115.81
6/14/2017 14:29	129.619	115.79
6/14/2017 14:29	129.592	115.76
6/14/2017 14:29	129.571	115.74
6/14/2017 14:30	129.564	115.73
6/14/2017 14:30	129.535	115.70
6/14/2017 14:30	129.516	115.68
6/14/2017 14:30	129.474	115.64
6/14/2017 14:31	129.473	115.64
6/14/2017 14:31	129.451	115.62
6/14/2017 14:31	129.441	115.61
6/14/2017 14:31	129.415	115.58
6/14/2017 14:32	129.384	115.55
6/14/2017 14:32	129.362	115.53
6/14/2017 14:32	129.34	115.51
6/14/2017 14:32	129.312	115.48
6/14/2017 14:33	129.301	115.47
6/14/2017 14:33	129.303	115.47
6/14/2017 14:33	129.273	115.44
6/14/2017 14:33	129.266	115.43
6/14/2017 14:34	129.245	115.41
6/14/2017 14:34	129.195	115.36

Well M57-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented	300 psi
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/14/2017 14:34	129.169	115.34
6/14/2017 14:34	129.172	115.34
6/14/2017 14:35	129.14	115.31
6/14/2017 14:35	129.119	115.29
6/14/2017 14:35	129.131	115.30
6/14/2017 14:35	129.095	115.26
6/14/2017 14:36	129.095	115.26
6/14/2017 14:36	129.061	115.23
6/14/2017 14:36	129.036	115.20
6/14/2017 14:36	129.022	115.19
6/14/2017 14:37	129.035	115.20
6/14/2017 14:37	129.002	115.17
6/14/2017 14:37	128.969	115.14
6/14/2017 14:37	128.958	115.12
6/14/2017 14:38	128.943	115.11
6/14/2017 14:38	128.909	115.08
6/14/2017 14:38	128.914	115.08
6/14/2017 14:38	128.889	115.06
6/14/2017 14:39	128.886	115.05
6/14/2017 14:39	128.848	115.01
6/14/2017 14:39	128.83	115.00
6/14/2017 14:39	128.809	114.98
6/14/2017 14:40	128.779	114.95
6/14/2017 14:40	128.796	114.96
6/14/2017 14:40	128.763	114.93
6/14/2017 14:40	128.747	114.91
6/14/2017 14:41	128.715	114.88
6/14/2017 14:41	128.727	114.89
6/14/2017 14:41	128.7	114.87
6/14/2017 14:41	128.685	114.85
6/14/2017 14:42	128.648	114.81
6/14/2017 14:42	128.619	114.79
6/14/2017 14:42	128.621	114.79
6/14/2017 14:42	128.595	114.76
6/14/2017 14:43	128.579	114.75
6/14/2017 14:43	128.547	114.71
6/14/2017 14:43	128.528	114.69
6/14/2017 14:43	128.525	114.69
6/14/2017 14:44	128.508	114.67
6/14/2017 14:44	128.465	114.63
6/14/2017 14:44	128.468	114.63

Well M57-O SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented	300 psi
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
6/14/2017 14:44	128.417	114.58
6/14/2017 14:45	128.414	114.58
6/14/2017 14:45	128.414	114.58
6/14/2017 14:45	128.388	114.55
6/14/2017 14:45	128.365	114.53
6/14/2017 14:46	128.323	114.49
6/14/2017 14:46	128.323	114.49
6/14/2017 14:46	128.303	114.47
6/14/2017 14:46	128.27	114.44
6/14/2017 14:47	128.254	114.42
6/14/2017 14:47	128.266	114.43
6/14/2017 14:47	128.242	114.41
6/14/2017 14:47	128.215	114.38
6/14/2017 14:48	128.199	114.37
6/14/2017 14:48	128.193	114.36
6/14/2017 14:48	128.16	114.33
6/14/2017 14:48	128.141	114.31
6/14/2017 14:49	128.101	114.27
6/14/2017 14:49	128.098	114.26
6/14/2017 14:49	128.075	114.24
6/14/2017 14:49	128.067	114.23
6/14/2017 14:50	128.032	114.20
6/14/2017 14:50	128.039	114.21
6/14/2017 14:50	55.571	41.74
6/14/2017 14:50	18.316	4.48
6/14/2017 14:51	13.268	-0.57
6/14/2017 14:51	15.33	1.50
6/14/2017 14:51	13.841	0.01
6/14/2017 14:51	13.683	-0.15
6/14/2017 14:52	13.69	-0.14
6/14/2017 14:52	13.687	-0.15
6/14/2017 14:52	13.682	-0.15
6/14/2017 14:52	13.709	-0.13
6/14/2017 14:53	13.728	-0.11
6/14/2017 14:53	13.752	-0.08

APPENDIX G

Cement Bond Log Summary



Southwest Exploration Services, LLC

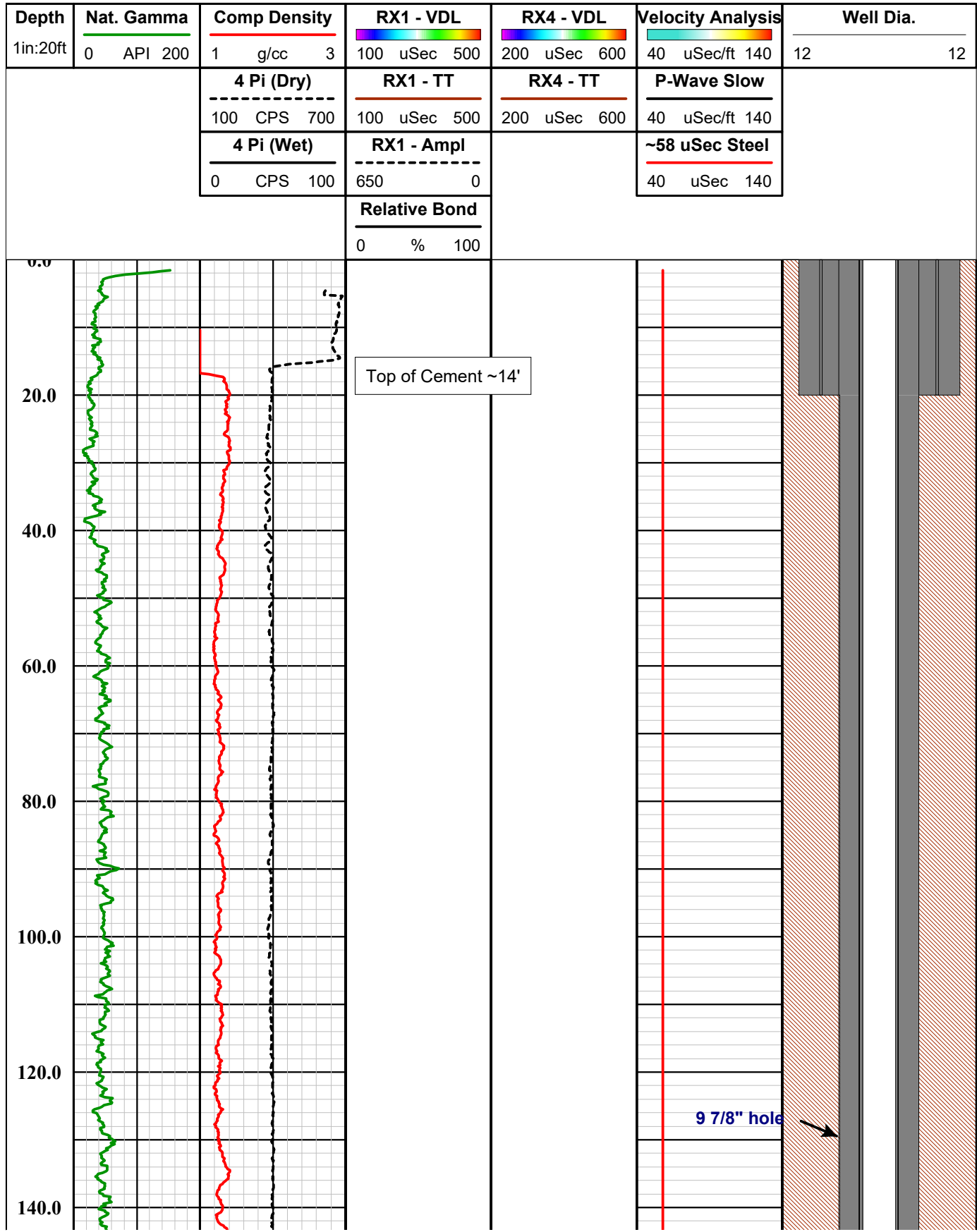
borehole geophysics & video services

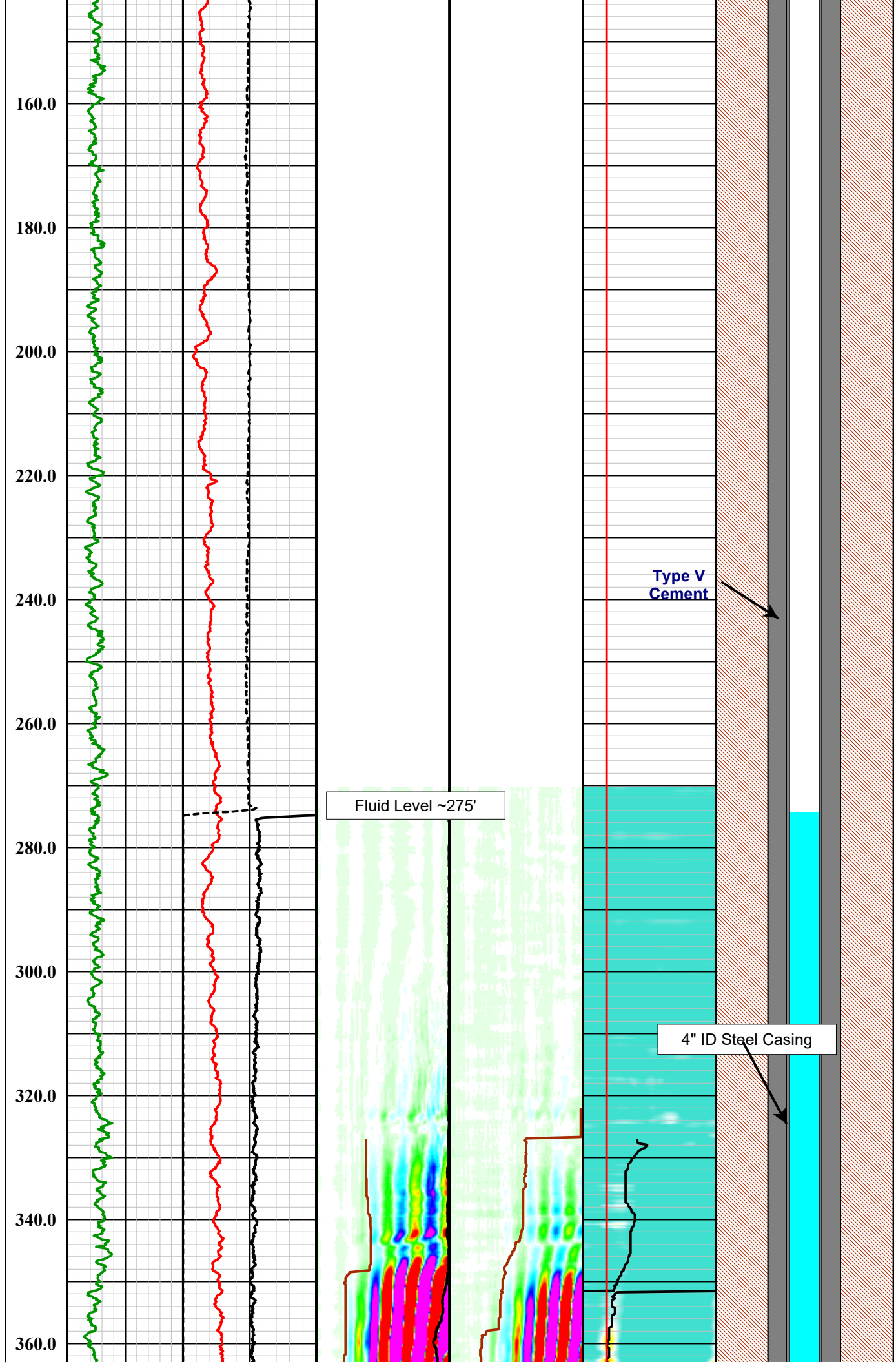
COMPANY FLORENCE COPPER				TYPE OF LOGS: CEMENT BOND LOG			
WELL ID M7-0				OTHER SERVICES 4 PI DENSITY TEMPERATURE			
FIELD FLORENCE COPPER							
COUNTY PINAL				STATE ARIZONA			
LOCATION							
SEC				TWP RGE			
PERMANENT DATUM				ELEVATION			
LOG MEAS. FROM GROUND LEVEL				K.B.			
DRILLING MEAS. FROM GROUND LEVEL				D.F.			
				G.L.			
DATE 03-15-17				MUD			
RUN No 2				MUD WEIGHT			
TYPE LOG CEMENT BOND LONG				VISCOSITY			
DEPTH-DRILLER 1200.0 FT				LEVEL			
DEPTH-LOGGER 1203.0 FT				MAX. REC. TEMP.			
BTM LOGGED INTERVAL 700.0 FT				IMAGE ORIENTED TO:			
TOP LOGGED INTERVAL SURFACE				SAMPLE INTERVAL			
DRILLER / RIG# NATIONAL				LOGGING TRUCK			
RECORDED BY / Logging Eng. E. BEAM				TOOL STRING/SN			
WITNESSED BY MATT - H&A				LOG TIME:ON SITE/OFF SITE			
				9:30 AM			
RUN BOREHOLE RECORD				CASING RECORD			
NO. BIT FROM TO				SIZE WGT. FROM TO			
1 ? SURFACE 40 FT				14 IN STEEL SURFACE 40 FT			
2 10 5/8 IN 40 FT				5 IN STEEL 40 FT			
3				5 IN PVC 525 FT			
COMMENTS:				TOTAL DEPTH			

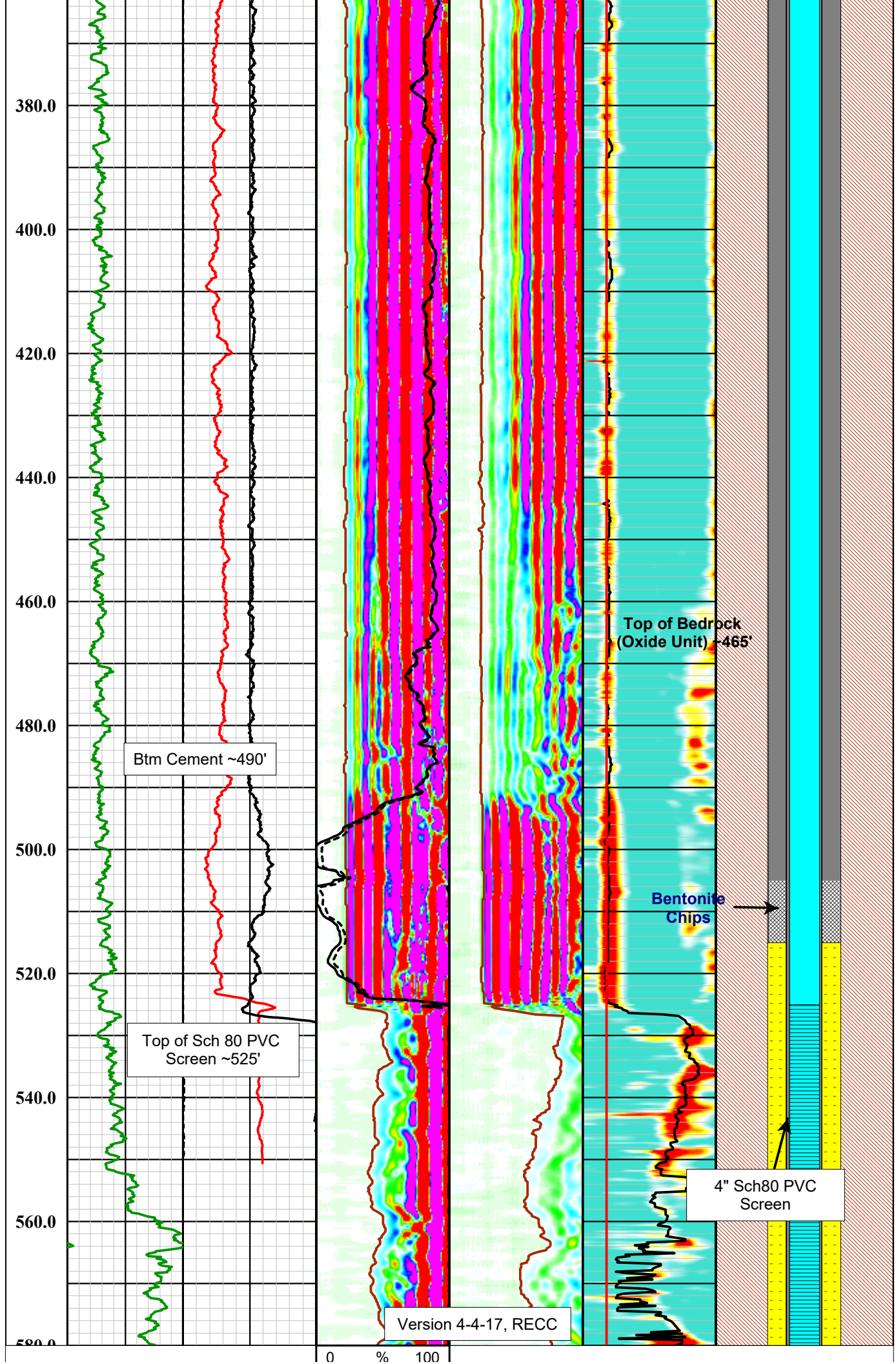
Tool Summary:					
Date	03-15-17	Date	03-15-17	Date	03-15-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	ALT 4 RX SONIC	Tool Model	COMPROBE 4 PI
Tool SN	4183	Tool SN	5185	Tool SN	6009
From	SURFACE	From	270.0 FT	From	SURFACE
To	1203.0 FT	To	700.0 FT	To	550.0 FT
Recorded By	E. BEAM	Recorded By	E. BEAM	Recorded By	E. BEAM
Truck No	900	Truck No	900	Truck No	900
Operation Check	03-14-17	Operation Check	03-14-17	Operation Check	03-14-17
Calibration Check	N/A	Calibration Check	N/A	Calibration Check	N/A
Time Logged	9:30 AM	Time Logged	10:45 AM	Time Logged	11:40 AM
Date	03-15-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI 2GDA	Tool Model		Tool Model	
Tool SN	3083	Tool SN		Tool SN	
From	SURFACE	From		From	
To	550.0 FT	To		To	
Recorded By	E. BEAM	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	03-14-17	Operation Check		Operation Check	
Calibration Check	03-14-17	Calibration Check		Calibration Check	
Time Logged	12:45 PM	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: N/A					
Calibration Points: N/A					

Disclaimer:

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.







				Relative Bond							
		0 CPS 100	650	0		40 uSec 140					
		4 Pi (Wet)	RX1 - Ampl			~58 uSec Steel					
		100 CPS 700	100 uSec 500	200 uSec 600	40 uSec/ft 140						
		4 Pi (Dry)	RX1 - TT		RX4 - TT	P-Wave Slow					
1in:20ft	0 API 200	1 g/cc 3	100 uSec 500	200 uSec 600	40 uSec/ft 140	12	12				
Depth	Nat. Gamma	Comp Density	RX1 - VDL	RX4 - VDL	Velocity Analysis	Well Dia.					

FWS50-4Rx Full Waveform Sonic Tool SN 5185

Probe Top = Depth Ref.



Four Conductor MSI Probe Top

Probe Length = 2.71 m or 8.9 ft

Probe Weight = ~18.0 kg or 39.6 lbs

Sensors: Ceramic Piezoelectric in Polyurethane potting

Transmitter Frequency: ~20 kHz resonant frequency

Rx - Rx Spacing: 0.2 m (7.9 in)

Typically ran centralized with external bow spring centralizers.

Can only be collected in fluid.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Rx-4 Tx - Rx4 Spacing = 1.2 m (47.2 in)

Rx-3 Tx - Rx3 Spacing = 1.0 m (39.4 in)

Rx-2 Tx - Rx2 Spacing = 0.8 m (31.5 in)

Rx-1 Tx - Rx1 Spacing = 0.6 m (23.6 in)

Acoustic Isolater



—— Tx = Acoustic Transmitter

0.155 m or 6.25 in. - End of tool to center of Tx

1.97" or 50 mm Diameter

4 Pi Density Tool SN 6009

Probe Top = Depth Ref.



—— Four Conductor Probe Top

Probe Length = 1.57 m or 5.17 ft

Probe Weight = 4.99 kg or 11.0 lbs

Uses an Cs 137 Radioactive Source

Detector Assembly: NaI crystal with Photo-tube

Temperature Rating: 107 Deg C (225 Deg F)

Pressure Rating: 344.7 bar (5000 psi)

1.25 in or 31.75 mm Diameter

MSI 2GDA Density

Probe Top = Depth Ref.

Tool SN: 3082, 3925, & 5273

——— Single Conductor MSI Probe Top

Probe Length = 3.20 m or 10.50 ft

Probe Weight = 17.3 kg or 38.14 lbs

2GDA can only be collected logging up hole due to the caliper.

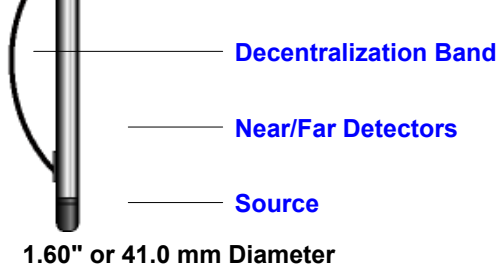
Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

——— Guard Resistivity = 1.11 m (43.74 in)

——— 1-Arm Caliper = 0.79 m (31.0 in)





MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

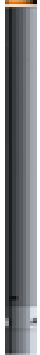
Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"



_____ TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



**Southwest Exploration
Services, LLC**
borehole geophysics & video services

Company	FLORENCE COPPER
Well	M57-0
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final	Cement Bond Log Summary
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APPENDIX H

Well Development Forms

FIELD DATA LOG

Project Name: Florence POC Wells	Project No.: 150342
Well No.: M57-0	Date: 3/30/2017
Location:	Measuring Point: Grab from discharge hose
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls): Submersible / 1185 ft (TOL)	Test Type: Pumping development
How Q Measured: Bucket / Stopwatch	BC Personnel: M. Frailey

	Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Imhoff Cone (mg/L)	pH	Sp. Cond. (µmhos/cm)	Temp. °F	Turbidity (NTU)	Comments
3/30	1045	—	—	—	—	—	—	—	—	SWL = 224.75 (TOL)
		Multiple pump on/off and reduced pump depth to remove drilling mud.								
	1220	Pump turned on. Depth back on bottom @ 1185 ft. Discharge is Drilling mud and getting clearer.								
	1230	20	230.30	—	—	—	—	—	—	Cloudy Tan
	1300	"	230.80	—	—	—	—	—	—	Hazy
	1330	"	231.00	—	—	—	—	—	—	Hazy
		Pump shut down. Allow to recover.								
	1420	Pump turned on. Discharge is drilling fluid at first								
	1500	Pump Shut down. Discharge was hazy when shut down.								
	1530	Pump Turned on. Brief muddy then clearing.								
3/31	1600	Pump off								
	1630	Pump on. Brief mud then clearing.								
	1700	Pump off - end of day.								
	0915	Pump on. Brief mud then clearing. SWL = 224.05 ft (TOL), Pre-pumping.								
	1015	Pump off. PWL = 230.10 ft (TOL). Discharge clear.								
	1115	Pump on. WL = 224.50 ft prior. Brief mud, then clearing.								
	1215	Pump off. PWL = 230.40 ft prior. Discharge clear.								
	1315	Pump on. Discharge briefly muddy then clearing to Cloudy tan.								
	1345	Pump off. Discharge clear.								
	1415	Pump on. Discharge brief mud then clearing.								
	1445	Sample = 7.5 NTU turbidity. Discharge clear, pump turned off.								
	1515	Pump on. Brief cloudy then clearing.								
	1545	Pump off. Discharge clear, Turbidity = 5 NTU.								
	1615	Pump on. Brief cloudy then clearing.								
	1700	Pump off. Discharge clear, Turbidity = 4 NTU								
	Comments:									

FIELD DATA LOG





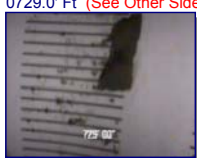

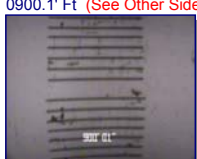
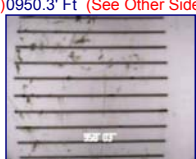




Project Name: <i>Florence POC Wells</i>	Project No.: <i>150342</i>
Well No.: <i>M57-O</i>	Date: <i>4/3/2017</i>
Location:	Measuring Point: <i>Grab from discharge hose</i>
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls): <i>Submersible / 1185ft</i>	Test Type: <i>Pumping Development</i>
How Q Measured: <i>Bucket / Stopwatch</i>	BC Personnel: <i>M. Frailey</i>

[illegible]

APPENDIX I

Video Log

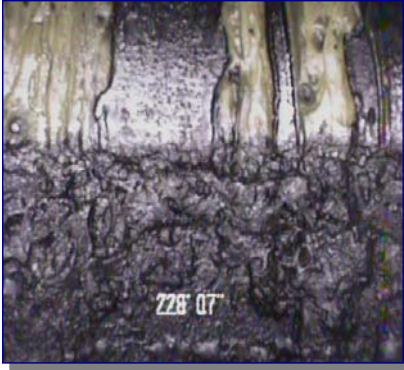
Client: **Florence Copper** Survey Date: **June 05, 2017**
 Address: **1575 W. Hunt Hwy** Invoice: **7953** Run: **1**
 City: **Florence** State: **Az** Zip: **85132** Well Name: **M57-O**
 Requested By: **Florence Copper** P.O.: _____ Well Owner: **Florence Copper**
 Copy To: **Florence Copper** Camera: **1 5/8" Color Camera**
 Reason For Survey: **General Inspection** Zero Datum: **Top of Casing**
 Location: **Florence Copper** Depth: **1200 Ft** Vehicle: **290**
 Field: **Florence Copper**
 Csg. I.D.@ Surface **5.25 In.** I.D. Reference: **Measured** Casing Buildup: **None**
 Operator: **Don Eckman** Lat.: _____ Long.: _____ Sec: _____ Twp: _____ Rge: _____

Wellbore Snapshots	True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
0228.7' Ft (See Other Side) 0525.5' Ft (See Other Side)  		Zeroed side view at top of casing.
	228.7'	Inspected several casing joint during survey. All appear to be in good condition.
	260.7'	Rough section of casing.
0528.2' Ft (See Other Side) 0560.0' Ft (See Other Side)  	426'	Static water level. Visibility good.
	527.9'	Light buildup on casing.
	1070'	Top of PVC horizontal slot perforations. Appear open.
	1107'	Light bio mass.
0729.0' Ft (See Other Side) 0810.2' Ft (See Other Side)  	1105'	Bio mass increasing.
	1140'	Visibility degrading due to suspended material.
	1171'	No Visibility. Ended survey.
0900.1' Ft (See Other Side) 0950.3' Ft (See Other Side)  		
1000.0' Ft (See Other Side) 1050.0' Ft (See Other Side)  		
1108.8' Ft (See Other Side) 1121.0' Ft (See Other Side)  		

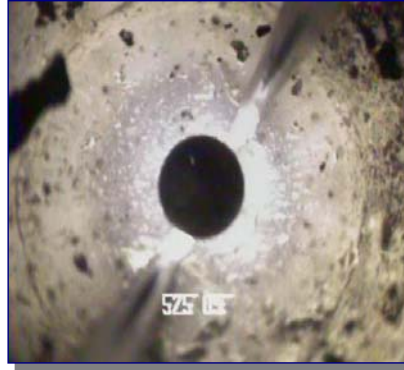
Notes:

12 WELLBORE SHAPSHOTS

0228.7' Ft (Enlargement)



0525.5' Ft (Enlargement)



0528.2' Ft (Enlargement)



0560.0' Ft (Enlargement)



0729.0' Ft (Enlargement)



0810.2' Ft (Enlargement)



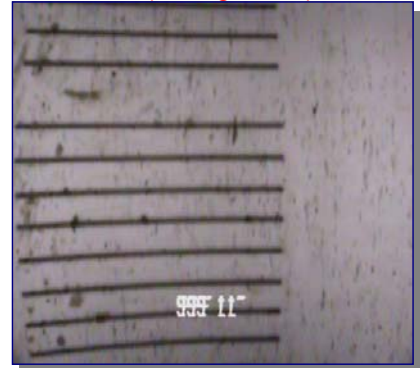
0900.1' Ft (Enlargement)



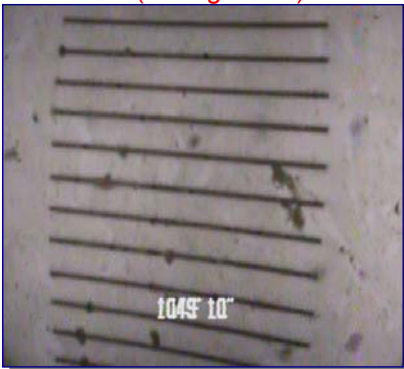
0950.3' Ft (Enlargement)



1000.0' Ft (Enlargement)



1050.0' Ft (Enlargement)



1108.8' Ft (Enlargement)



1121.0' Ft (Enlargement)

